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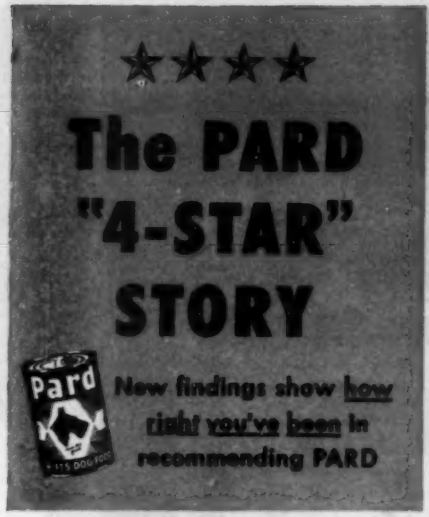

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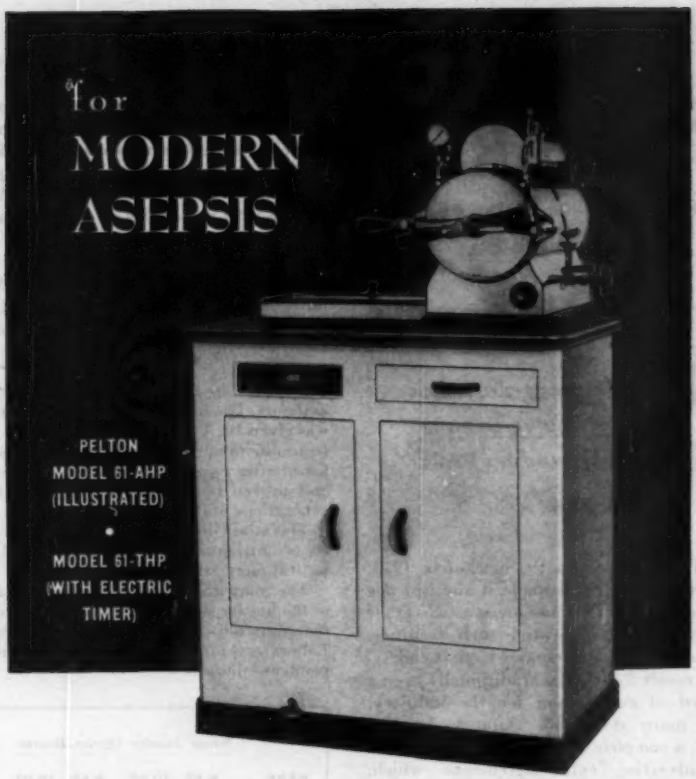

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AVMA ☆ Report

Veterinary Medical Activities

✦ The Councils on Education of the American Veterinary Medical Association, the American Medical Association, and the American Dental Association compared notes at a joint meeting in Chicago on Jan. 16, 1951. The AVMA Council was represented by Drs. W. A. Aitken and W. A. Hagan, chairman and secretary, respectively.

★ ★ ★

✦ Committee appointments made by President W. M. Coffee since publication of the roster include: Dr. J. W. Cunkelman added to Food and Milk Hygiene; Dr. W. H. Feldman added to Scientific Exhibits; and Dr. H. J. Griffiths replacing Dr. Benjamin Schwartz on Nomenclature of Diseases.

★ ★ ★

✦ The JOURNAL of the AVMA probably is quoted more frequently and more extensively than any other in its field. Two articles on veterinary medical aspects of atomic explosion, by Col. W. O. Kester and Major E. B. Miller, have been reprinted in many friendly countries to emphasize this fact anew.

★ ★ ★

✦ Assistant Executive Secretary C. D. Van Houweling, and Mr. J. J. Shaffer of the public relations department, spoke for the AVMA at the Illinois V.M.A. meeting in Chicago, Jan. 30-Feb. 1, 1951.

★ ★ ★

✦ Deans H. D. Bergman, W. A. Hagan, and W. R. Krill, and Drs. M. S. Shahan and C. D. Van Houweling, acting as a joint committee, prepared a statement on veterinary medical education during a national emergency and submitted it to the National Security Resources Board.

★ ★ ★

✦ Morbidity and mortality statistics are again brought to the fore. The editorial in this JOURNAL presents a concise review and emphasizes the importance of full coöperation from every veterinarian, but especially of those in practice, diagnostic, and control work (*see* p. 184).

★ ★ ★

✦ The atomic bomb is headline news almost daily. What the veterinarian may expect if brought in contact with it is discussed in detail in an article by Col. J. H. Rust in this issue (*see* p. 135).

★ ★ ★

✦ The AVMA exhibits on brucellosis and cysticercosis-trichinosis will be shown at the Minnesota Spring Barrow Show in Albert Lea, March 15-17, 1951. The state veterinary medical association is sponsoring the showings.

★ ★ ★

✦ "Better Publicity For Your 1951 Convention" is the title of a new booklet which went to all constituent associations in January, and which is available to local and regional associations upon request. Prepared by the public relations department, it gives valuable guidance on planning convention publicity.

★ ★ ★

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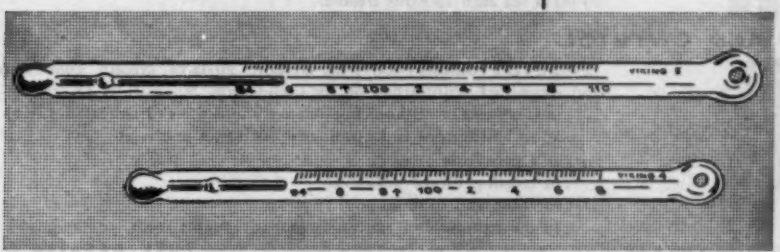

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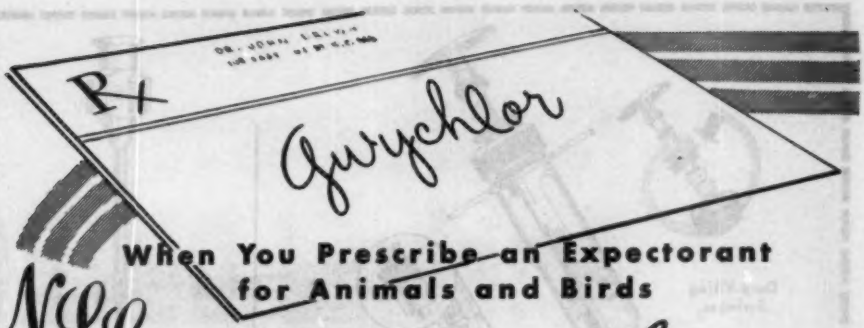

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Journal
of the
American Veterinary Medical Association

VOL. CXVIII MARCH, 1951 NO. 888

Food Inspection and Nuclear Energy

LIEUTENANT COLONEL JOHN H. RUST, V.C., U.S. ARMY

WITHOUT DOUBT, one of the most fascinating aspects of veterinary medicine is that it is never static. New concepts and discoveries, both from within and without the immediate field of the profession, are constantly changing the veterinarian's way of life and thinking. So it is then that we must often evaluate the impacts of a changing world upon veterinary medicine. In food inspection, we see a possible impact but so far this is not a reality.

Since the days of Roentgen and Becquerel, it has been known that ionizing radiations have a definite effect upon biologic systems. Often the mechanism or manner in which these changes were brought about was not clear. Even today this is true, though many working hypotheses and theories have been suggested to explain observed phenomena Most of us are not deeply concerned with the mechanisms, leaving them to the investigator in the laboratory. So it is not proposed that all of these questions should be raised in this discussion, but only those problems that are of interest to a large segment of veterinarians—those practitioners who are interested in food inspection, either as a federal, state, or municipal function.

The veterinary clinician who is familiar with the use of roentgen rays, either as a diagnostic or therapeutic aid, is quite cognizant of the damage that is caused by excessive doses of ionizing radiation upon the skin. He is familiar also with the precautions necessary to reduce the hazard both to his patient and to himself. The most readily observed change is seen in the skin. In fact, it has been used in dosage calculations for many years as the erythema dose, *i.e.*, that dose of ionizing radiation which causes a reddening of the skin. A dose of this magnitude, if not often repeated, may not result in permanent damage. As the exposure is increased though, the effects become more pronounced. The epithelium will show various degrees of inflammatory change ranging through an increasing degree of severity until necrosis occurs. Epilation is often observed with the deeper follicles suffering somewhat less than those near the surface. Loss of sebaceous and sweat glands requires greater doses than ever. With the loss of epithelium, ulcer formation and slow healing occur. Pigmentation is altered. When hair returns, it is often of a finer texture and colorless. A delayed effect that has often been noticed is sarcoma formation. While this has been most often observed in man, it occurs with at least equal frequency in small laboratory animals. With even moderate doses of ionizing radiations, the lymphocytes begin to be reduced in number. They are very sensitive and, with sufficient magnitude, lymph nodes almost entirely disappear. At the same time, though they are more resistant, the epithelial cells of the gastrointestinal canal begin to break down. This breaking of the natural barriers of the body, plus the loss of the defense of the lymphocytes, makes it possible for organisms that are normally symbiotic or saphrophytic to invade the host and become pathogenic when heavy doses of ra-

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diation are given over the abdominal region or whole body. In these cases, a widespread bacteriemia is the end result.

Apart from the above effects, it has often been noticed in animals when a large part of the body, particularly the abdomen, is exposed to sublethal but high rates of exposure, that they exhibit malaise and nausea. This is, no doubt, the same thing as the radiation sickness that occurs in man. Just what brings it on is not known, in spite of considerable study. These are a few of the most prominent effects, and it is apparent that animals presented for slaughter and suffering from acute or chronic radiation sickness can be judged by criteria already in effect.

The problems presented by high-level, acute exposures due to nuclear reactions, such as occur in the vicinity of an atomic bomb blast, are somewhat similar. In general, it may be said that the effects from the radiation release are inversely proportional to the distance from the center of the explosion. In addition, there are the effects from the blast and heat which multiply the complications. As a rule of thumb, it can be generalized that the nearer the epicenter of the explosion the more likely it is that the exposed animals will be immediately destroyed. It does seem, however, that this is an academic question since the number of animals exposed, with the possible exception of pet animals, will be so small that any attempt to save them would be a waste of effort. This is true because the cost of an atom bomb is so great that it would be an unwise expenditure of money to waste it upon the nonindustrial or nonresidential areas where the large proportion of our animal population is kept. However, if by chance a stockyard happened to be located in or near the site selected for destruction, then some problems might arise. In such an event, surviving animals should be suitable for slaughter provided they do not show evidence of radiation sickness, bacteriemia, or assimilation of radioactive foodstuff. Radiation, in itself, is not harmful to the consumer if it does not bring about serious secondary effects to the food animal.

In the nuclear reaction, many radioactive elements are formed in the fissioning of the materials. If these fission products become distributed over the area in which animals are pastured, definite hazards are created. Fortunately, the absorption by way of the intestine is slow. Here is a good example from which we can gather some information: In this particular case, fission products created by a bomb burst fell upon cattle grazing in a distant pasture. These animals exhibited typical radiation burns with subsequent epilation. There was some scarring and the hair that returned was white giving a "grayed" appearance to the backs of these animals. No reports have been made upon the presence or absence of malignant tumors, but it is quite possible to speculate that they might occur either on the exposed skin or even possibly within the respiratory tract if enough of the radioactive material was inhaled while grazing on dusty pastures. These animals are being held for observation during their natural life. They should provide further valuable information as time goes on.

The intake of radioactive materials (by ingestion or respiration, primarily, though subcutaneous or intravenous administration might also be considered) may be of interest. In the case of the inspired radioactive particles, if we assume that some are of a particulate size approximating those of carbon in the air, we can readily accept the fact that they will eventually be deposited by phagocytes in the pulmonary lymph nodes as are carbon particles in anthracosis. This is a common finding at necropsy in all animals kept in areas with a high particle count of carbon in the air. If such a material is radioactive, there will be a constant bombardment of the tissues with *alpha*, *beta*, or *gamma* radiation. All of these can be responsible for malignant tumors of the lung.

Ingested radioactive material may be important or not depending upon several factors. First, will it pass the intestinal barrier in the form in which it is ingested or will it subsequently be altered by the action of digestive processes and then absorbed? Second, will it be biologically concentrated or diffusely distributed throughout the body? In the case of iodine which is concentrated in the thyroid, a radiosensitive tissue, a comparatively small amount of the radioactive form would bring on, in a reasonably short time, a marked destruction of thyroid tissue. But if it was radioactive sodium, which is diffusely spread, a much larger activity would be re-

quired to produce a serious effect. A third factor to be considered is, how rapidly is the radioactive element or compound eliminated? If it were radioactive iron in the male, the loss by hemorrhage would be negligible and might, because of its long tenure and concentration in the red blood cells and spleen, cause a specific injury to them. A fourth consideration is the type of radiation emitted by the radioactive element and its half-life (half-life is that period of time required for a radioactive material to reduce itself by one half). Of course, if the half-life is longer than that of the animal considered, it might well be an eternity. *Alpha* particles are the most hazardous when taken internally and deposited in an organ or tissue. *Beta* particles are also bad internally. Both of these are less serious externally, because their mean free path is relatively short, hardly skin deep. Internally, when deposited in important loci, they become quite a problem because the density of ionization per centimeter of path is very high. This is the criterion by which they are judged. High energy *gamma* rays are less of a problem than low energy x-rays, because the higher the energy the less the ionization for each centimeter traversed. Plutonium or radium, both "bone-seekers" and *alpha* particle emitters, are very damaging to the marrow, a most important tissue. Bone tumors are common sequelae after deposition of either of these elements. Fortunately, at least in the case of plutonium, the absorption rate by way of the intestinal tract is very slow.

At present, much information is based upon speculation. At times, this is adequate but often it is far from satisfactory. *Gamma* radiation, in itself, is not harmful to foodstuffs either on the rail or in package. This is an example where experiment is not needed. It is only when the living animal becomes subject to the effects of radiation that a food-inspection problem arises. It is well to repeat, "Radiation of nonliving foodstuffs is not harmful." This probably is true also in cases of exposure to a neutron flux of short duration and moderate intensity. It is conceivable, but not likely in practical situations, that the induced radiations in foodstuffs can become hazardous to the consumer. Here, too, there come into play those factors mentioned above under the topic of internal radiation hazards. In addition, the neutron flux intensity, the time of exposure, the chemical constituents of the foodstuffs, their avidity for neutrons of the energies present, and the type of shielding given by the container are all important modifying factors. Where living animals intended for food are exposed, it can be expected that they will respond to neutrons much in the same manner as those exposed to x-ray or *gamma* radiation. The mechanism of the effect is somewhat different but the end results are essentially the same.

The hazards from *alpha* particles and fission products or induced radioactivity to the animal have been mentioned before, and the hazards to the consumer are essentially the same. Probably there will be a dilution factor, though this is by no means certain. However, the danger in contamination of packaged or unprotected food is a real possibility due to the fall of radioactive substances upon them. How these will create problems and how the solution may differ can be illustrated by using three different hypothetical examples. If, for instance, a bomb were set off high in the air, then the neutron flux would be low, and forgetting the blast and heat effects, probably the only problem created would be from a mild degree of induced radiation and some fall from the condensed fission products and unconsumed bomb matrix. It is possible that this would create no real important hazard. Of course, as the point of detonation approaches closer and closer to the earth, greater induced radioactivity would be created and the scatter of fission products and alpha emitters would undoubtedly become greater. These would be a serious problem to personnel handling the foodstuff and it is quite possible that such foodstuff would need to be abandoned. If, however, it was felt that it must be used, decontamination procedures would have to be used with techniques of aseptic surgery; *i.e.*, rubber gloves, gowns, and face masks, plus definite precautions with reference to the radiation hazards present. This last is a very difficult procedure and should be used only in desperation. Another possibility would be an underwater blast which would spread radioactive materials in the water for a considerable distance. This would have the effect of carrying radioactivity into deep recesses that the pre-

viously mentioned situations would not be likely to do. Here again, it would seem unlikely that it would be worth the risk incurred unless the need for the food was urgent.

One other possibility of some importance is the chance that animals consuming radioactive forage either from induced radioactivity, or fall out of *alpha* emitters or fission products would secrete them in their milk. This is known to occur with radioactive strontium in rats. It is quite possible that it would do the same with other radioactive elements closely related to calcium. There is no evidence for this assumption, but it should be investigated exhaustively.

In order to reduce the chances of consuming radioactive elements, the following procedures are suggested: In all slaughtering establishments, survey meters should be set along ramps leading to the killing floor. These should be placed in such a way that any animal bearing radioactive material would be detected as it passed. Then, a similar arrangement should be made along the carcass rail and over the moving viscera pans to detect radioactivity in the internal organs that were shielded by the body of the living animal. Survey of processed foods may or may not be feasible, but if it is suspected that animals with radioactivity are passing the "friskers," such a procedure would be advisable.

As can be seen, the advent of the atomic age does add actual and potential problems for the veterinarian to solve. They are no more complex or difficult than many that we have already passed. There is no doubt that a satisfactory solution of this new phase can be made.

Foot-and-Mouth Disease Breaks Out Again in Mexico

A new outbreak of foot-and-mouth disease in Mexico has dimmed any hopes there may have been for a quick finish to the eradication campaign. The outbreak, involving at least 37 known cases of type A infection in a cattle herd of 56, started during Christmas week (1950) on a farm near Colmalteco in the state of Veracruz, the U.S. Department of Agriculture said. Repeated inspections over a wide radius will be required to tell whether the virus has fanned out to other herds.

The disease struck just when it seemed that campaign personnel would chalk up an entire year without an outbreak. The latest previous outbreak occurred in December, 1949.

A bright spot in this otherwise bad situation is that it was possible to make a complete laboratory diagnosis within two days after the outbreak was reported by the owner. Contrast this with earlier stages of the campaign, when there was a long and often costly delay in diagnosis, not to mention that many stock owners tried to keep officials from learning of an outbreak, instead of reporting it as this owner did.

Much of the credit for the stepped-up efficiency in diagnosis belongs to veterinarians of the United States and Mexican federal services. Working with other scientists, they developed a complement-fixation technique that permits quick distinction between foot-and-mouth disease and vesicular stomatitis, which coexist in Mexico. The test also is used in identifying the strain of foot-and-mouth disease involved in any given outbreak.

The herd stricken in Veracruz was last vaccinated around April, 1950. Infected animals were slaughtered as soon as laboratory tests confirmed the field diagnosis. Latest information indicated that resumption of vaccination is not planned, but inspections will be intensified to keep watch for any new signs of trouble.

Press releases from the USDA suggested no cause for alarm, but the situation apparently is serious enough to warrant a more critical evaluation of the entire program. A step in that direction was a conference of Mexican and United States officials at Secretary Brannan's office in Washington early in January. The delegation, which included federal veterinarians from both countries, was headed by Lic. Oscar Flores, director of the joint commission, and General Harry H. Johnson, co-director.

One of the big questions in the minds of veterinarians is how long good luck coupled with port-border vigilance will veil United States and Canadian herds from this disease — and whether the governments of these two countries are giving enough top-level attention to internal preparedness against an outbreak.

Control of Fresh Water Snails (Intermediate Hosts of Liver Flukes) in Florida

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IN RECENT MONTHS, concern has been aroused over the discovery of liver flukes, *Fasciola hepatica*, Linn., in cattle shipped from Florida to feeders in other states. However, flukes have been reported from 22 states, being most prevalent along the Pacific Coast, in the Rocky Mountain area, and the Gulf Coast region. This parasite causes the condemnation of liver for human consumption, which is reflected back to the cattleman in the form of dockage on the livers condemned at slaughter (fig. 1). In Florida alone, the livers condemned because of fluke infection amounted to $41,214.88 for 1947 and $60,143.50 for 1948. Losses other than liver condemnation caused by flukes include: (1) loss in weight of cattle and stunting of growth; (2) deaths of severely infected animals; (3) reduction of milk flow in dairy herds and pounds gained on beef cattle; (4) reduced calf crop; and (5) reduced carrying capacity of pastures.

REVIEW OF LITERATURE

The life cycle of *F. hepatica* was determined by Thomas[1] in 1883. Shaw and Simms[2] in Oregon, and Sinitsin[3] in Louisiana reported the first natural infection of North American snails with liver fluke miracidia. The bionomics of the different lymnaeid snails have been investigated by workers in the regions where they occur. Olsen[4] observed that the ova of *Stagnicola bulimoides techella*, Hald., the intermediate host in Texas, hatched in six days and sexual maturity was reached as early as fourteen days after hatching. This snail was able to survive five months of drought and high summer temperatures by burrowing into the mud. The general trend was two generations annually, with an average longevity of six months. The average egg production for 4 snails was 5,112. Walton and Wright[5] found *Limnaea truncatula* (Muller), the European host, in waters having a pH of 6.0 to 8.6. Mehl[6] reported that this snail had a longevity of 10 to 17 months and could survive desiccation for as long as four and one half months. According to Ross and McKay,[7] *Limnea brazieri* (Smith), the Australian intermediate host, was unable to withstand complete

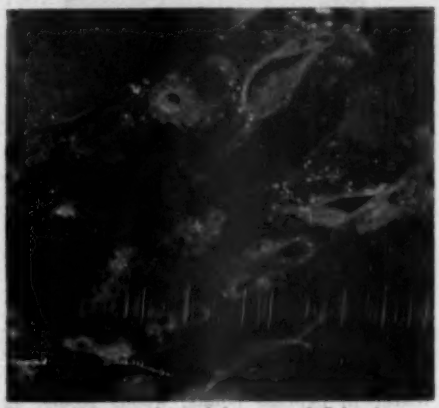

Fig. 1—Liver condemned because of fluke damage. Note the destruction of liver tissue and enlargement of bile ducts.

desiccation longer than twenty-four hours; however, they survived on moist mud. This snail was found in waters with a pH of 5.4 to 7.3. Swanson[8] found that *Pseudosuccinea columella* Say and *Fossaria cubensis* Pfr. were intermediate snail hosts of liver flukes in Florida.

ECOLOGY OF FRESH WATER SNAILS IN FLORIDA

It has been observed that *P. columella* and *F. cubensis* (fig. 2) have distinct preferences as to breeding areas. One pond will have large numbers of snails while an adjacent one, similar in all apparent respects, will contain none. In an effort to correlate the occurrence of these snails with ecologic factors, water samples were secured from areas throughout the state and analyzed in coöperation with the Soils Department of the Florida Agricultural Experiment Station. Right-handed snails seem to prefer water which is medium in chlorides (60 p.p.m.); however, they have

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been found less frequently in waters varying from low to very high chlorides. The suitable range of conductivity appears to be between 15 and 35, but some have been found in water with a reading of 170. Calcium is necessary for the formation of the shell. This may account for their occurrence in water which is medium in

Fig. 2—A lymnaeid snail which serves as intermediate host for liver flukes in Florida.

calcium (21 p.p.m.). Right-handed snails are in greatest abundance in water with a pH of 7.5 to 8.5. Water which is ideal for snail growth has a subterrestrial origin or flows over marl or heavily limed soils. Water in cypress ponds, woods ponds, or that flowing over sand or muck is not suitable for their growth.

The lymnaeid snails, *P. columella*, collected from enzoötic areas, were naturally infected with rediae of *F. hepatica*. Naturally infected snails liberated from 1 to 225 cercariae, with an average of 44.6 per snail from 33 field-collected mollusks. Experimentally infected snails, *P. columella*, liberated from 7 to 55 cercariae in a period of forty-eight to fifty-three days following infection. The cercariae encysted on vegetation and other objects at the water surface; however, a small percentage encysted to a depth of ½ in. below the surface and some were free in the water. The identity of the fluke cysts was determined by feeding these cysts to susceptible animals and the recovery of adult flukes from the liver at necropsy ninety days following ingestion.

Snails are very prolific, producing egg masses every month of the year. The greatest production of egg masses begins in May and continues on through October; then there is a decided drop in propagation. Egg masses of *F. cubensis* contain from 15 to 41 ova, with an average of 28. An aquarium stocked with 2 adult *F. cubensis* had a population of 1,492 in eight months.

SNAIL CONTROL

The present plan for fluke control in Florida is based on eradicating the snails which serve as intermediate hosts, dosing the host animals with hexachloroethane to kill the adult flukes in the bile ducts, and raising fluke-free calves. Snail control may be achieved by proper drainage, application of copper sulfate, filling low areas, or fencing off ponds. The latter is unreliable in Florida because of the danger during heavy rains, in which the snails may be carried out by high water and shed fluke cercariae on pastures. The cost of filling low areas is prohibitive in many localities.

When an area is drained, snails migrate downward in an attempt to follow the receding water line and congregate in pools where water remains longest. There, they burrow into the ground, crawl into mole, cricket, and crayfish trails, or crawl under debris. Live snails have been found 4 in. below the surface; however, the majority were observed in the upper ¼ in., beneath alluvial deposits. Snails have been maintained for four months on sand which remained moist from seepage, dew, and occasional showers.

A block of dirt 2 in. thick, 6 in. wide, and 10 in. long was taken from an experimental ditch. All visible snails were removed from the surface and the block placed in an aquarium with enough water to keep it damp. During seventeen days, a total of 146 juvenile snails were removed from the block and water surrounding it. Two additional blocks containing large populations of juvenile snails were placed in aquariums and water was added. One week later, the standing water was removed and the soil allowed to become powdery dry. After fourteen and sixteen days, respectively, water was again added to the aquariums and, within two hours, numerous snails were swimming in the water. Approximately 300 live snails were recovered in two days.

These experiments indicate that snails are capable of estivating for at least sixteen days in dry sand and four months in moist sand. This greatly complicates snail eradication in that complete drainage is

difficult to achieve. Florida ranchers prefer to maintain the water table 4 in. below the ground surface to secure good grass for grazing. Even with complete drainage, there is seldom a two-week period without some precipitation such as dew and light showers.

To prevent snail breeding, the drainage must be so thorough that no water stands for longer than seven days. If snails are protected from the sun by old logs, boards, bridges, culverts, or heavy vegetation, they will survive the dry periods in sufficient number to reinfect the premises. All ditches should be constructed in a wide V-shape with no high vegetation, which will allow the sun to kill the snails. Culverts and small bridges should be replaced with iron landing strips laid in the V-shaped shallow ditch. Overflowing watering troughs supplied by artesian wells will maintain an ideal breeding ground, so they should be equipped with automatic cut-offs controlled by floats.

Copper sulfate is the chemical now recommended for snail control. Effective concentrations may be secured by using one of the three methods of application. The chemical may be applied by broadcasting on ponds, sloughs, or wet areas at the rate of 20 lb. per acre foot. To insure good distribution, 1 part of copper sulfate should be mixed with 4 parts of sand. For flowing streams and irrigation water, gravity flow from barrels of 5 per cent concentrate into stream flow may be utilized. It should be calibrated to deliver 663 cc. per cubic foot second (448.83 gal./min.) flow of water. This will kill all the snails within the distance the stream flows in twenty-four hours. Spraying is most efficient, because of greater penetration through vegetation, even distribution, and ease of handling. A power spray, having an agitator and capable of maintaining 400 lb. nozzle pressure, is ideal for the application of the mixture of 33 lb. of powdered copper sulfate and 400 gal. of water. Surface of the water and at least 10 ft. of the adjacent ditch banks should be sprayed with a broom-type nozzle.

CONCLUSION

Fluke control in Florida is dependent upon dosing the host animal with hexachloroethane to kill the adult flukes in the bile ducts, and eradicating the snails which serve as intermediate hosts. Snail eradication may be accomplished by destroying their breeding areas and by application of copper sulfate.

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New Screw-worm Remedy

A new treatment for the old pest of screw-worm infection has been announced by the U. S. Department of Agriculture. It is to be known as "EQ 335" and will replace the Department's "EQ 62." The formula for the new remedy incorporates 3 parts by weight of lindane, 35 parts of pine oil, 42 of white mineral oil, 10 of an emulsifier, and 10 of a silica gel. It is applied to wounds with a small paint brush and kills maggots deep in the wounds, young maggots as they hatch from the eggs, and flies attracted to the wound to feed or lay more eggs.

Strawberry Foot Rot in Sheep

This disease, which is a proliferative dermatitis of the legs, is similar to contagious pustular dermatitis, but it confers no immunity to the other disease nor to itself. The scabs which form will harbor the causative agent in viable form as long as a year.—*J. Comp. Path., abstr. in Vet. Bull., (April, 1950).*

The Organization of Veterinarians for Civil Defense

The book, "Health Services and Special Weapons Defense" (*see* p. 86 February, 1951, JOURNAL for review), outlines briefly the organization of veterinarians for civil defense activities. There must be federal, state, and local organizations. Veterinarians' civil defense activities come within the realm of the Health Resources Office of the National Security Resources Board. The Bureau of Animal Industry of the USDA has supplied the veterinary medical consultant to this office, who, through cooperation with the Emergency Advisory Committee of the American Veterinary Medical Association, serves as the profession's representative and liaison. Since the BAI has a large force of veterinarians and has the national responsibility for meat inspection and animal disease control, it is logical that it should serve as the national operational civil defense agency. The BAI representative who is the consultant to the N.S.R.B. is a member of the AVMA Emergency Advisory Committee, thereby assuring integration and coördination of the activities of the Health Resources Offices, the AVMA committee, and the BAI. The U. S. Public Health Service is closely associated with the medical aspects of civil defense planning and organization. The

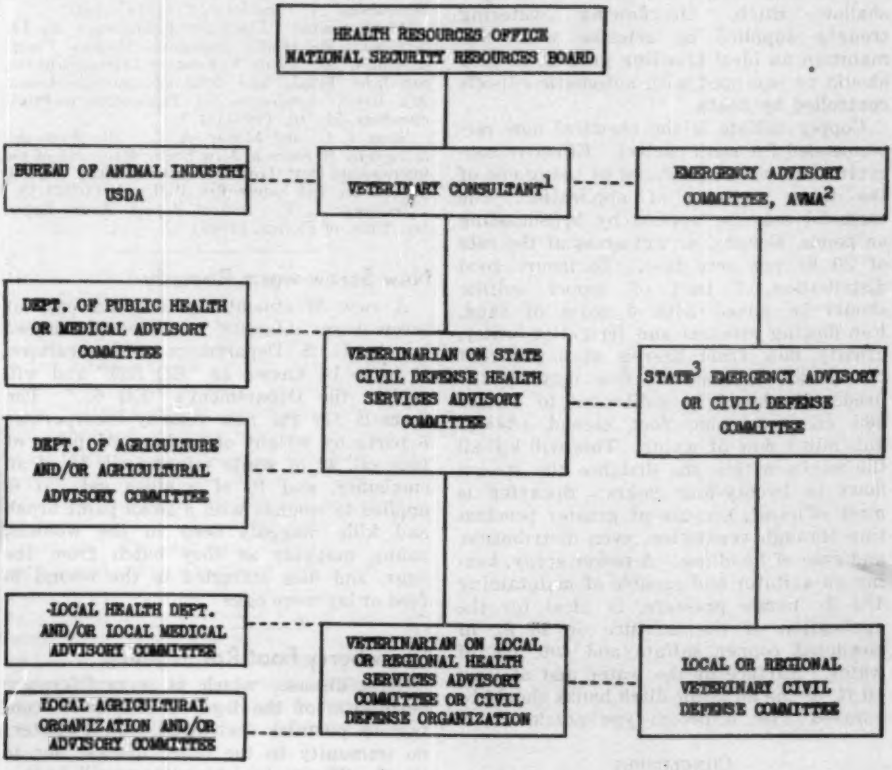

Diagram of Organization of Veterinarians for Civil Defense

[1]Present consultant is Dr. Asa Winter, assistant chief, Tuberculosis Eradication Division, U.S. BAI.
[2]Represents all branches of veterinary medicine (see JOURNAL, Nov., 1950, p. 435).
[3]Appointed by state veterinary medical associations.

chief of the Veterinary Public Health Division of the U.S.P.H.S. is also a member of the AVMA committee and will help to coordinate the medical aspects of the veterinary civil defense activities and planning at the national level.

Therefore, at the national level, all phases of veterinary medicine are well organized and represented without the loss of functional integration and coördination. A similar type of organization has to be established at the state level.

REGIONAL ORGANIZATION

Many segments of civil defense have interstate aspects and the veterinary medical activities are no exception. However, since the BAI is a national operational agency, it can coördinate the interstate planning and organization. Later, if it seems necessary or desirable to have interstate regional organizations, they can be easily established.

STATE ORGANIZATION

Practically every state now has a civil defense organization consisting of a council with a director and advisory committees. In all states, a veterinarian should be a member of the state civil defense Health Services Advisory Committee.

In most instances, the veterinary medical association will have to request and press for this representation. The strategic position veterinarians occupy in the defense against biologic warfare directed toward animals dictates the necessity of such representation. The book "Health Services and Special Weapons Defense" presents this subject of biologic warfare against animals comprehensively and conclusively.

Since responsibility for the control of contagious animal diseases at the state level rests with the chief livestock sanitary official in coöperation with the BAI veterinarian in charge, it seems quite natural that one of these officials should be the veterinarian on the state civil defense Health Services Advisory Committee. This veterinary medical representative on the Health Services Advisory Committee may be chairman of a state committee of veterinarians, but if not chairman, he should in all cases be a member of the committee.

STATE VETERINARY COMMITTEES

Practically every state veterinary medical association has appointed a committee, at the suggestion of the AVMA, to serve as an advisory committee on the selection of personnel for military duty and for civil defense planning. Some states have two committees, one functioning as a procurement advisory committee and another for civil defense activities.* The committee (s), if composed of representatives from the various segments of the profession, as suggested by the AVMA, can logically serve as the state veterinary medical civil defense committee. They will function in an advisory capacity to the veterinarian on the state civil defense Health Services Advisory Committee and assist him to establish local veterinary medical committees. They and the veterinarian on the state Health Services Advisory Committee shall be responsible for the veterinary civil defense planning and functions within the state and advise local committees of their functions.

Since the civil defense responsibilities of veterinarians are twofold—primarily to the animal owners and secondarily as a supplement to the medical profession—the state veterinary medical committee must maintain constant liaison with the departments of agriculture and public health of the state governments. Likewise, liaison must be maintained with the medical civil defense committees and, if one exists, the agricultural civil defense committee or organization. If the chief livestock sanitary official who is in the department of agriculture is the chairman or a member of the state veterinary medical civil defense committee and on the state civil defense Health Services Advisory Committee, this liaison would seem assured.

LOCAL OR REGIONAL ORGANIZATIONS

The fixed geographic limits of the local veterinary medical civil defense organizations must be variable. In areas where there are five or more veterinarians in each county, a county organization would seem feasible. However, the veterinary medical organizations will have to be adapted to fit the over-all local civil defense organization. In other words, there may be need for city veterinary medical civil defense organizations or, on the other extreme, one veterinarian may have to be a member or advisor to several county or local civil defense organizations. In states where there are

*A roster of these committees will be published in an early issue of the JOURNAL.

organized regional veterinary medical associations, they should have a committee on civil defense whose primary duty will be to see that veterinarians are represented in the civil defense planning and organization within the area. Local or regional veterinary medical committees and activities must be coördinated with agricultural and medical organizations and activities as at the state level.

BIOLOGIC WARFARE DEFENSE ORGANIZATION

Veterinary medical planning for civil defense against atomic bomb attacks can be ignored except in the densely populated metropolitan "target" areas. Therefore, most local veterinary medical civil defense planning and organizations will deal almost entirely with problems of biologic warfare against animals. Therefore, the liaison and coöperation with the agricultural civil defense organization is paramount. Individual veterinarians should be members of local agricultural civil defense organizations and livestock committees. All veterinarians must be alerted and on the look-out for biologic attacks against animals. A later section will describe in detail the organization and planning necessary to prevent and combat biologic warfare attacks against animals.

ORGANIZATION FOR DEFENSE AGAINST ATOMIC ATTACK

In the areas that may be subjected to atomic bombings, veterinarians must be organized to assist the medical organization in every way possible during the period immediately following an attack. A veterinarian should be a member of the local medical civil defense advisory committee and be responsible for organizing the local veterinarians for whatever assistance they may be requested to supply as members of medical first-aid teams.

After the acute emergency following an attack, veterinarians will have to be organized to cope with animal casualties, stray animals, and zoo animals. This planning and organization will have to be carefully coördinated with the over-all civil defense planning and organization. The local veterinary medical organization should also be prepared to function as inspectors of food of animal origin. The determination of the wholesomeness of such food within the target area will be an important veterinary medical activity. Personnel of the Meat Inspection Division of the BAI and local veterinary public health workers should be responsible for this function.

State-level planning must include an accurate, up-to-date roster of all veterinarians. Their availability for emergency civil defense service should be determined. Plans for the utilization of all veterinarians in a state, in the event of an all-out emergency, should be carefully formulated and developed so they can be put into action without delay.

The Air Force and the Veterinary Service

It is Air Force policy to utilize the professional capability of the Veterinary Service in its broadest application in the field of preventive medicine, particularly in the inspection of all types of foods, in mess inspection, and food sanitation, and in the control of food-borne diseases and diseases of animals communicable to man. It is also their policy that veterinary officers assist in other phases of preventive medicine and public health to the limit of their capability, says Col. W. O. Kester, chief, Veterinary Division, U. S. Air Force, Washington.

The importance of an early, accurate diagnosis of disease and the prompt reporting of diseases can not be overemphasized in connection with civil defense planning.—Col. W. O. Kester, V. C.

Student chapters of the AVMA were suggested in 1924 by Dean C. H. Stange of Iowa, the necessary changes in the constitution were made in 1925, rules and regulations to govern such chapters were adopted at the annual meeting in August, 1926, and within six months, five chapters had been organized.

Parasites and Veterinary Practice

Although it may be desirable to enter the field of study and treatment of verminous parasites in horses, this particular field of veterinary medicine is a difficult one in which to gain credit, and a still more difficult one in which to gain remuneration (*Vet. Rec., 62*, Oct. 28, 1950: 613-616).

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Nerve Block of the Eye and Associated Structures

D. R. PETERSON, D.V.M.

Stillwater, Oklahoma

A simple and satisfactory method of anesthetizing the bovine eye and its associated structures is desirable because of the increasing amount of surgery being performed.* For most of the surgery of the eye to date, anesthesia has been obtained by the infiltration of a local anesthetic solution into the eyelids and the tissues immediately surrounding the eyeball. Although this has been a satisfactory means of anesthetizing the eye, it is time consuming. Also, when inflammation and edema are present in the tissues, it is difficult to get the structures completely anesthetized. Recently, some practitioners have been injecting the anesthetic solution deeply into the orbital cavity. Some insert the needle at the fornix conjunctiva, and others insert the needle at the edge of the rim of the bony orbit. They then direct the needle toward the apex of the bony orbit and deposit the solution near the entrance of the optic nerve through the optic foramen. This technique has proved satisfactory for some practitioners while others have experienced bad effects,

From the School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater. Dr. Peterson is professor of anatomy.

*Dr. G. T. Easley of Governor Turner's Ranch, Sulphur, Okla., at the author's request and after a demonstration of the technique, reports that he used the technique on 16 cases of surgery on the eye with excellent results. The author advises that Dr. Easley has adopted it for all cases where anesthesia of the eye is involved.

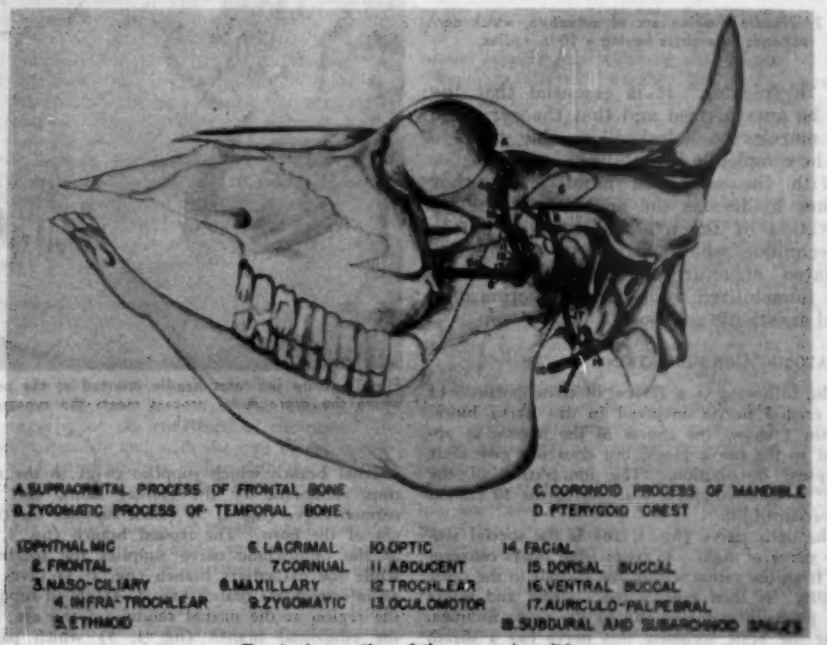

Fig. 1—Innervation of the eye and eyelid.

with death of the animal resulting in some cases.

For removing small neoplasms from the cornea, membrana nictitans, or the eyelids, either by surgery or by performing tissue coagulation and fulguration with

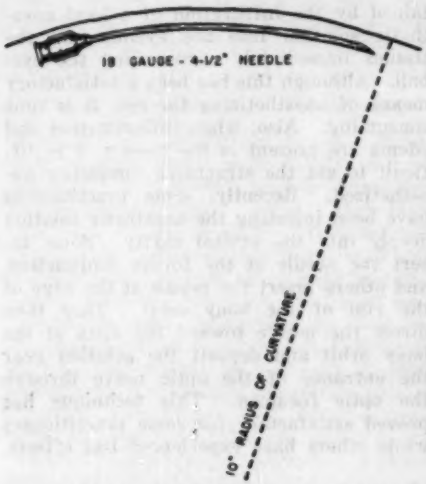

Fig. 2—Needle showing arc of curvature, which corresponds to a circle having a 10-in. radius.

the "hyfrecator," it is essential that the eye be anesthetized and that the nerves to the muscles be "blocked" so that the eye can be completely immobilized.

With the above in mind, the author wishes to discuss the anatomy of the innervation of the eye and to demonstrate a technique whereby the eye and its associated structures can be anesthetized and immobilized by a single injection of a local anesthetic solution.

ANATOMIC CONSIDERATIONS

The following is a review of those portions of the cranial nerves involved in this nerve block. Figure 1 shows the course of the nerves, as applied to the nerve block, but does not give their complete distribution. The innervation of the eye[1,2] is quite complex, with six of the 12 cranial nerves involved.

The optic nerve (fig. 1, 10) is the special sensory nerve of sight. It arises from fibers converging from the retina within the eyeball to the optic papilla. It then pierces the choroid and sclera and passes posteromedially to the optic foramen. Near the optic foramen, this nerve has a sheath composed of extensions of the meninges of the brain and includes continuations of the subdural and subarachnoid spaces. This probably accounts for the bad effects and fatalities which result when the anesthetic is deposited deeply at the apex of the bony orbit. The solution could occasionally, be deposited directly into the subdural and subarachnoid spaces (fig. 1, 18) and, in large enough doses, would be capable of reaching the vital centers in the medulla oblongata.

The abducent (fig. 1, 11), trochlear (fig. 1, 12), and oculomotor (fig. 1, 13) are motor nerves which supply the retractor, recti, and oblique muscles of the eyeball and the levator palpebrae superioris muscle. In cattle, they all emerge through the foramen orbitorotundum and pass to their respective muscles.

The ophthalmic division (fig. 1, 1) of the trigeminal nerve emerges through the foramen orbitorotundum, and supplies fibers to the upper eyelid and lacrimal gland by way of its lacrimal branch (fig. 1, 6). The latter also gives off an

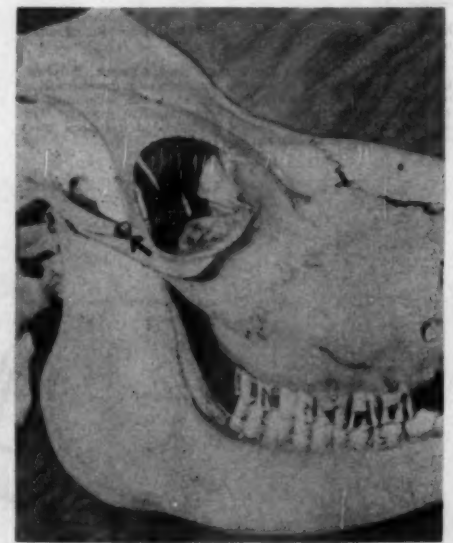

Fig. 3—Arrow indicates needle inserted at the point where the supraorbital process meets the zygomatic arch.

internal branch which supplies twigs to the mucous membrane of the frontal sinus, and the cornual nerve (fig. 1, 7) which supplies the corium of the horn. The frontal branch (fig. 1, 2) of the ophthalmic nerve supplies the forehead, while the nasociliary branch (fig. 1, 3) gives off an infratrochlear branch (fig. 1, 4) which supplies the region at the medial canthus of the eye, and the ethmoidal branch (fig. 1, 5) which passes

through the ethmoidal foramen to be distributed to the nasal mucosa.

The maxillary division (fig. 1, 8) of the trigeminal nerve passes out through the foramen orbitorotundum. Only its zygomatic or orbital branch (fig. 1, 9) is concerned in the innervation of the eye. It supplies twigs to the lower eyelid and the skin of that region.

The facial nerve (fig. 1, 14) emerges through the stylomastoid foramen. It has numerous branches, but the only important one in the orbital region is the auriculopalpebral branch (fig. 1, 17). This branch leaves its parent trunk soon after its emergence through the foramen and passes anterodorsally in the superficial fascia over the zygomatic arch. Twigs are then distributed to the muscles of the eyelids and the anterior auricular muscles. It is the author's opinion that the auriculopalpebral nerve also carries some sensory fibers from the eyelid.

TECHNIQUE OF THE NERVE BLOCK

The complexity of the innervation of the eye would seemingly make it quite difficult to block the nerves but, fortunately, most of the nerves come out through the foramen orbitorotundum. When one thinks of the innervation of the eye, the first nerve that comes to mind is the optic. Actually, it is the least important of the nerves from the standpoint of surgery on the eye, because only in extirpation of the eye is the optic nerve surgically involved and because it contains mainly the nerves of the special sense of sight, with relatively few, if any, fibers conducting pain. With the above in mind, the author believes that the anesthetic should be deposited just anterior to the foramen orbitorotundum where most of the nerves to the eye and eyelids are emerging.

To anesthetize the eye, use a 4 ½-in., 18-gauge needle which has been bent as indicated in fig. 2. The technique will be described with the head of the animal in the natural position, so that the incline of the face is normal and a line between the eyes is horizontal. Under aseptic conditions, insert a short, 16-gauge needle through the skin in the depression just posterior to the point where the supraorbital process (fig. 1, A) meets the zygomatic arch (fig. 1, B). (*See* fig. 3 and 4.) Deposit a small amount of the anesthetic solution under the skin, then withdraw the needle and follow it with the long, curved needle. With the concavity of the curvature of the needle directed posteriorly and with the hub of the needle held at a point slightly higher than the point of insertion of the needle, insert the needle until it strikes the coronoid process (fig. 1, C) of the mandible. Work the point of the needle off the anterior border of the process and, by holding the hub slightly above the horizontal plane, insert the needle until it hits the bony plate forming the floor of the pterygopalatine fossa. The depth of insertion will vary from 3 to 4 ½ in., depending on the size, sex, and breed of the animal. The only tissues which the needle passes through are the periorbital fat and the edge of the temporalis muscle. The internal maxillary artery normally traverses the pterygopalatine fossa ventral to the point where the needle strikes the floor of the fossa. It should be a part of the standard technique, however, to withdraw the plunger of the syringe to ascertain whether the needle is in a blood vessel. Deposit 15 cc. of a 2 per cent sterile solution of procaine hydrochloride. This will block all nerves coming out of the foramen orbitorotundum, namely, the oculomotor, trochlear, abducent, ophthalmic, and maxillary.

Fig. 4—Arrow indicates position of needle in living animal.

With the above technique, it is almost impossible to deposit the anesthetic into the subdural and subarachnoid spaces, as the pterygoid crest (fig. 1, D) forms a shelf protecting the optic foramen. The osseous structures listed in the diagram of the nerves form definite landmarks for use as a guide to insert the needle so as to be able to deposit the anesthetic at the proper location.

The above technique may be sufficient in some surgery of the eye; however, there will still be considerable twitching of the eyelids which may be objectionable, as it interferes with the general operative procedure. This is due to the fact that the auriculopalpebral branch of the facial nerve has not been blocked. Complete anesthesia can be effected by anesthetizing this nerve. This can be accomplished by withdrawing the needle so that its point lies just beneath the skin. Then, proceed to direct the needle posteriorly in the superficial fascia lateral to the zygomatic arch for a distance of 2 to 3 in., infiltrating the tissue with the anesthetic solution as you insert the needle.

Other Uses of the Block

This nerve block can be used in those dehorning cases where the more standard nerve block of the cornual nerve, described by Frank,[3] fails. The ophthalmic nerve, from which the cornual nerve fibers originate, is blocked as it emerges from the foramen orbitorotundum and at this point its course is not variable.

The skin and periosteum of the frontal region and the mucous membrane of the frontal sinus are anesthetized by this block. Its use would then be indicated when it is necessary to trephine the frontal sinus for empyema or to remove the pus and infected material from the sinus by way of the opening at the base of the horn.

In removing small neoplasms from the cornea, one may block the auriculopalpebral nerve to immobilize the eyelids and apply a topical anesthetic to the cornea with fairly satisfactory results. However, there will usually be some rotation of the eyeball if the deeper block has not been used. For most surgical procedures on the eye, it will be best to use both of the nerve blocks described.

References

[1]Sisson, Septimus, and Grossman, J. D.: The Anatomy of the Domestic Animals. W. B. Saunders Publishing Co., Philadelphia, Pa., 1948.

[2]Habel, R. E.: Guide to the Dissection of the Cow. Cornell Coöperative Society, Ithaca, N.Y., 1949.

[3]Frank, E. R.: Veterinary Surgery Notes, Burgess Publishing Company, Minneapolis, Minn., 1947.

Inhalation Anesthesia and Local Analgesia with Ethyl Chloride

Ethyl chloride, largely overlooked in veterinary medicine, is unequalled as an inhalation anesthetic for small animals, including birds (E. O. Longley, M.R.C.V.S., *Vet. Rec.*, March 18, 1950). Animal and human patients tolerate ethyl chloride exceedingly well. Being highly volatile, it should be given in an enclosure to cats, such as a rectangular, all-glass battery jar (government surplus, 14 by 12 by 6 in.). For dogs, ethyl chloride may be administered from wool in a mask, in the usual way. The optimum concentration of this anesthetic is 10 to 12 per cent.

Light anesthesia is attained, without causing delirium or struggling, within two minutes after the liquid is poured and the jar covered, and deep anesthesia then follows rapidly. Duration of the deep anesthesia is two to four or five minutes, or sufficient time for such procedures as castration and tooth extraction. Ethyl chloride also was recommended for local analgesia, especially in nervous animals, large or small, about to receive injections and likely to resent the prick of the needle. It is sprayed on the site for a few seconds, until the coat looks frosted.

Remnants of the Mullerian Ducts in Bulls

Remnants of the Mullerian ducts have been pointed to as a cause of infertility in bulls.

Recalling the elementary embryology, these ducts empty into the cloaca, then, as the new being grows, they develop the vagina, the uterus, and the oviducts. In the male, they disappear or degenerate into small saclike tubules by the time of fetal maturity and may persist in that form through life.

The alleged importance attached to them is based on their frequency in bulls of low fertility.

Abdominal Rupture in Mare

An 8-year-old mare was presented with a tear about 15 in. long at the ventral lateral junction of the abdominal wall. This mare had produced 2 foals and was six weeks from foaling again. Intestines protruded from the rupture. These were washed with warm saline solution and replaced. The tear was then sutured and the sutures were supported by a corset fashioned from tractor belting. Later, leather was used to form a supporting belt 16 in. wide over the torn area. The animal recovered uneventfully except that a hernia about the size of a man's head remained.

At the time of foaling, the owner called and an examination showed that the mare was hemorrhaging badly from a tear about 5 in. long in the dorsal wall of the body of the uterus. The damage resulted from an attempt by the owner to deliver a foal being presented with one foreleg retained. When the position was corrected, the foal was delivered readily. No attempt was made to suture the uterus, but recovery was uneventful. The foal was normal, developed well, and was sold for $3,600 when 3 years of age. The mare has since produced 2 normal foals.—*W. E. Lyle, D.V.M., in Vet. Science News, University of Wisconsin.*

A New Aid in Intramedullary Pinning

R. L. LEIGHTON, V.M.D., and
FRED KEEFE, V.S., B.V.Sc.

Springfield, Massachusetts

During the progress of our work on intramedullary pinning, it became apparent that some sort of an aid to the introduction of the pin into the lower fragment would be useful. Upon the suggestion that some sort of a grooved director or guide might be constructed, we had a tentative model prepared. This instrument is a useful adjunct to the bone surgeon's armamentarium.

Fig. 1—The grooved pin director.

The Instrument.—The instrument (fig. 1) consists of a grooved shank with a stout handle and a suitably curved tip. Measuring 8 in. long, it is sturdily made of stainless steel. The shank is provided with a stop which in turn can be secured in any position by means of an Allen set screw.

Method of Use.—When the intramedullary pin has been placed in the upper fragment and the attempt to insert the pin into the lower fragment is to be made, the curved end of this instrument is placed in the medullary cavity of the lower fragment (fig. 2). The point of the pin from the upper fragment is placed in the groove and with proper manipulation it is guided into place. The pin director is then removed. The stop that is provided is useful in those cases where the pin would ride up too far on the director making it impossible to execute the maneuver intended.

SUMMARY

A newly developed instrument and its use in pin placement in intramedullary pinning is described. It is hoped that practitioners interested in small animal intramedullary pinning may find this instrument of value.

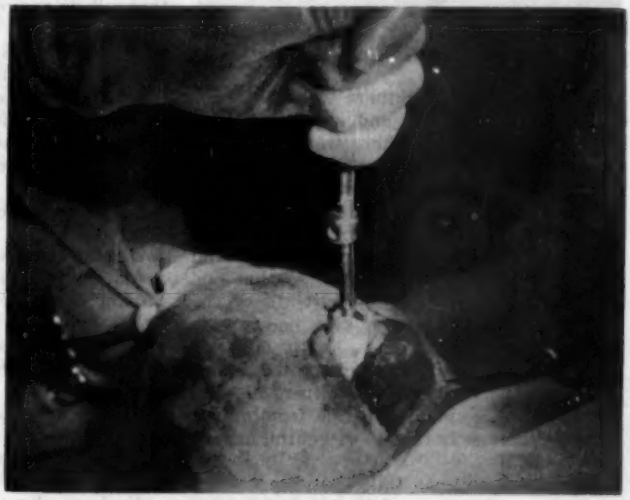

Fig. 2—Grooved pin director in use, pin protruding from upper fragment rests in groove. Curved tip of instrument is in medullary cavity of lower fragment. Right hand of operator controls pin which is protruding near hip. Assistant supports lower fragment. As angle between fragments is decreased, director guides pin.

From the Rowley Memorial Hospital, Springfield, Mass.

Monstrosity in a Cat

Monstrosities are well known in large animals, but are less numerous in small animal practice. In addition to a litter of 3 normal cats, there was one disfigured. It lived for some hours, and then died. The birth was normal.

Fig. 1—Monstrosity in a cat.

As shown in fig. 1, there was one head. There was one upper and one lower jaw, but a palatoschisis. There were, however, two capiti occipitales and also two vertebrae atlantes and two backbones. Two hindquarters are seen and the 2 animals are grown together at the breastbones. In order to make room for the heart and lungs, the ribs were distorted so that one sternum appeared at the back, while on the ventral surface only the ribs had grown together.

There were four front legs, but only one heart, one pair of lungs, one liver, one diaphragm, and a single intestine terminating in two rectums. Both sets of genital organs were male.

Nature sometimes fails, but the wonder is how rarely these failures occur, considering the limitless possibility for their formation. We can admire and be thankful for the regularity of nature.—*Dr. E. J. Voute and E. E. van der Dussen (Biologist), Amersfoort, Holland.*

The Question of Euthanasia

A. I. STERN, D.V.M.

Waterbury, Connecticut

With the ever increasing biologic, chemical, and antibiotic weapons, with the improved and new diagnostic aids, with the development of more skillful surgical techniques, especially in orthopedics, the indications for euthanasia in small animal practice have been drastically cut. However, it seems that many practitioners are still suffering from a yesteryear hangover and often are hasty in suggesting euthanasia.

True, we have the legal right and sometimes the justification to suggest euthanasia but we must be honest with ourselves and satisfied with our services to this modern day society in every single instance that we terminate the life of someone's pet.

I am not here concerned with the performance of euthanasia at the request of a client but, rather, with the decision which so often falls upon the practitioner as to the advisability of its performance.

It is false reasoning to assume that one's reputation reflects in a better light if euthanasia is suggested for cases of doubtful prognoses.

In the client's eyes, a hasty decision in favor of euthanasia, whether the client subscribes to the decision or not, appears to be a confession of the lack of skill in veterinary science or indicates a sympathetic indifference on the part of the practitioner.

All of us, sometime or another, have been confronted with a client presenting his pet for treatment, who in the course of conversation relates an incident of his animal having been seriously ill some months or years ago and that one or more veterinarians had given his pet up. He boasts of the fact that he took him home and cured him himself.

This is the most uncomplimentary thing that can be said about veterinary science in general and about a practitioner in particular.

Such a client does more harm to the process of educating the public to veterinary services than perhaps a dozen satisfied clients can overcome. He makes his succeeding visits to a veterinary hospital only under duress and the results obtained

on his animal must border on the miraculous to convince him that veterinary science offers a worth-while service.

Animals which present a very poor prognosis — such as distemper complications, feline enteritis, gastrointestinal disease, heart disease, and senility, to mention a few — will on occasion reward our efforts and patience in medical treatment by making a suitable recovery. If the animal does not recover, the worst a client can claim is that an effort, however feeble, *was* made to save his animal's life.

There are, of course, restrictions in treating these cases in that some clients will absolutely refuse to pay a fee, and there is the exceptional client who will accuse a veterinarian of prolonging an animal's treatment for the sake of obtaining a larger fee. The latter is usually an eccentric type and should not cause much concern.

In cases where surgical intervention is necessary to prolong or save an animal's life, an even more serious consideration should be given the decision for or against euthanasia. Many veterinarians fail to become proficient, or fail to maintain their proficiency, in complicated or difficult surgical procedures only because they do not do enough surgery. Some refuse to operate if a client can not meet the requested fee. Most professional athletes who depend upon their physical alertness for their best performance do not fail to stay in shape during their off season months. Surgeons who refuse to operate on private patients for an adjusted fee do not suffer from rusty technique because much of their surgery is performed on nonpaying human patients.

Veterinarians, like professional athletes and human surgeons, should maintain a high degree of efficiency. In order to maintain this efficiency, it is often necessary to perform surgery without proper compensation. Certainly, a client who *is* willing to pay a fair fee for a difficult procedure, such as a perineal hernia repair, an enterotomy, or an open bone reduction is entitled to a skillful performance of that operation.

The reward for contributing time and effort will be the ability to do better surgery, the gratification of having saved an animal's life, and veterinary science will receive invaluable word-of-mouth publicity which will raise it to even a higher level than it now enjoys.

In summarizing, go very slow before deciding upon euthanasia. Let us offer society no less skill and service than it deserves and no less than we are capable of giving.

Surital Sodium Anesthesia in Canine Surgery

H. B. ROBERTS, D.V.M.; W. E. WENDT, D.V.M.; C. C. WAGNER, D.V.M., M.Sc.; T. F. REUTNER, D.V.M., M.S.

Cleveland, Ohio, and Detroit, Michigan

Surital sodium,* a recently developed ultra short-acting thiobarbiturate, has been reported by Reutner and Gruhzit[1] to produce an excellent surgical anesthesia of short duration in dogs when administered intravenously at the rate of 17.5 mg. per kilogram of body weight. They reported that induction and recovery periods were free of side reactions and that recovery was complete in three to five hours. The present report is an analysis of data obtained from 100 operations on dogs in which surital sodium was the sole anesthetic used.

MATERIALS AND METHODS

The surital sodium was obtained in sterile bottles with rubber diaphragm caps containing 1 Gm. of the dry material. The solution was prepared by the addition of 25 cc. of sterile distilled water to each bottle to give a 4.0 per cent solution. The preparation, when used, varied from a few minutes to six days in age. The solution was a clear yellow-amber. It was injected intravenously into the radial vein at a rate commonly used with other barbiturates. The first half of the dose was given quite rapidly in approximately two to ten seconds. The remainder was administered at approximately 1 cc. per minute until the desired depth of anesthesia was obtained.

The body weights of dogs ranged from 7 to 97 lb. with an average of 20.8 lb. Ages varied from 6 weeks to 18 years, with an average of 6.3 years. Of the dogs, 68 were males and 32 were females. Most of

From the Drs. Roberts and Wagner Animal Hospital, Cleveland (Roberts, Wendt, Wagner); and Detroit, Mich. (Reutner).

[1]Reutner, T. F., and Gruhzit, O. M.: Surital Sodium, A New Anesthetic and Hypnotic J.A.V.M.A., 113, (1949) :357-360.

*Parke, Davis & Company trade name for sodium 5-allyl-5-(1-methylbutyl)-2-thiobarbituric acid.

the common breeds were represented. A summary of the operations performed is shown in table 1.

TABLE 1—Summary of Operations Performed on Dogs Under Surital Sodium Anesthesia

Operations (No.)	100
Ave. age of dogs	6.3 years
Sex	
Males	68
Females	32
Ave. weight	20.8 lb. (7-97 lb.)
Ave. cc. 4% surital per 5 lb. body weight	0.99 (0.50-1.58)
Ave. duration of operations	11.5 min. (1-20 min.)
Ave. recovery time	1 hr. 40 min. (30. min.-4 hr.)
Type of operation	
Dental	26
Tumor	20
Amputations	14
Eczema treatments	9
Harderian gland removals	7
Foreign body removals	6
X-ray examinations	3
Urethotomy	3
Trauma repair	2
Misc.	10
Degree of anesthesia	
Complete	98
Required additional surital	2
Reactions during recovery	
None	76
Salivation	20
Thrashed around	1
Movements head & legs	1
Died	2*

*One died, 1 euthanasia.

RESULTS

The induction of anesthesia in every case was rapid and entirely free of struggling or other undesirable reactions. The degree of surgical anesthesia was excellent in all but 3 cases, 1 of which was a nervous 14-year-old dog that required a second injection of surital sodium before good anesthesia was obtained for twenty minutes. Another dog started to feel pain in ten minutes and required an additional small dose to complete a fifteen-minute operation. The third dog died two minutes after completion of injection, apparently of respiratory failure.

The duration of the operations varied from one to twenty minutes with an average of eleven and one half minutes. Recovery from the anesthesia was complete in thirty minutes to four hours, with an average recovery time of one hour and forty minutes. Of the dogs, 76 showed no undesirable reactions during recovery and 20 were noticed to salivate more than normal. One very nervous Cocker Spaniel struggled moderately during the first part of the recovery period but was entirely normal in one hour and twenty-five minutes. A 14-year-old, obese Pomeranian with a valvular insufficiency and considered a poor risk for anesthesia showed paddling of the legs during the first part of the recovery period. This dog was normal thirty minutes after the operation. One dog was given surital sodium for convenience of handling prior to euthanasia with magnesium sulfate.

TABLE 2—Age in Relation to Dose of Surital Sodium

Age range	Operations (No.)	Ave. age	Ave. weight	Ave. dose (cc./5 lb.)
Under 1 yr.	16	5 mo.	17.6 lb.	1.18
1 to 5 yr.	29	3.3 yr.	35.0 lb.	1.00
6 to 10 yr.	37	8.4 yr.	31.3 lb.	0.94
Over 10 yr.	17	12.9 yr.	36.0 lb.	0.85

Table 2 shows the number of operations performed on dogs of various age groups. It was found that young dogs required somewhat higher doses of surital sodium than old dogs. Those under 1 year of age required an average of 1.18 cc./5 lb. of body weight while dogs over 10 years of age required only 0.85 cc./5 lb. of body weight.

As shown in table 3, there was also a difference in drug requirement in dogs of various weight groups. Dogs weighing less than 20 lb. required 1.14 cc./5 lb. of body weight, while dogs weighing more than 40 lb. required 0.84 cc./5 lb. of body weight. The average dose for the 100 operations was found to be 0.99 cc./5 lb. of body weight.

TABLE 3—Body Weight in Relation to Dose of Surital Sodium

Body weight	Operations (No.)	Ave. weight	Ave. dose (cc./5 lb.)
Under 20 lb.	24	13.7 lb.	1.14
20 to 40 lb.	57	27.8 lb.	0.96
Over 40 lb.	18	63.7 lb.	0.84

DISCUSSION

As has been found true with other barbiturates, the dose of surital sodium required to produce a satisfactory surgical anesthesia was found to vary with the age and weight of the dog. Young, small dogs required somewhat more drug than old, obese patients. From data published by Reutner and Gruhzit, we estimated the dose for all dogs on a weight basis of 1 cc. of a 4.0 per cent solution for every 5 lb. of body weight. With this as a guide, we made our injections as described above

until the desired effect was achieved. For the entire group of operations, the average dose was 0.99 cc./5 lb. of body weight.

Surital sodium was a safe and satisfactory anesthetic for all short term operations. Induction was rapid and free of side reactions. The anesthesia was complete and recovery was rapid and usually free of undesirable reactions, permitting discharge of the patients immediately after the operation in many cases. It was used without ill effect in 13 dogs 12 years old, or more, some of which were considered poor anesthetic risks.

SUMMARY

Surital sodium, a new thiobarbiturate for short term operations, was found to be a safe and satisfactory anesthetic in 99 operations on dogs. Dosages varied with age, weight, and condition of dogs, with young, small animals requiring more drug. Recovery from the anesthetic was complete in approximately one and one half hours.

A Case of Secondary Ectopic Pregnancy in a Mare

F. J. MILNE, M.R.C.V.S.

Fort Collins, Colorado

An Arabian mare, 11 years old, was admitted for observation on May 8, 1950. According to the owner, foaling should have occurred one month previously, but no evidence of labor was observed. A gradual loss of weight had been noticed over the two-week period prior to admission. There had also been a vaginal discharge over the previous few days. The mare was listless although the appetite was good. The condition was described by the veterinarian in attendance as poor. The temperature was normal.

The case was diagnosed as one of emaciation due to malnutrition. The mare was discharged on May 12 with advice as to diet.

On August 6, the owner sought advice for "blood in the urine," which the mare was now showing. He was requested to bring in a urine sample but failed to do so.

On August 11, the mare was readmitted and examined. The hollowing of the flanks and large size of the abdomen indicated an advanced pregnancy, but the normal increased size of the mammary gland of advanced pregnancy was not evident.

Rectal exploration revealed a gravid uterus extending well forward over the pelvic brim into the abdominal cavity. Since no abnormality could be detected and the mare was now in good condition, a policy of negative treatment was adopted.

There were good grounds for supposing that the service dates were wrong.

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The author is indebted to Dr. James Farquharson who, with the author's assistance, performed the operation, and to Drs. F. Bracken and J. Palotay for carrying out the histopathologic aspect of the case.

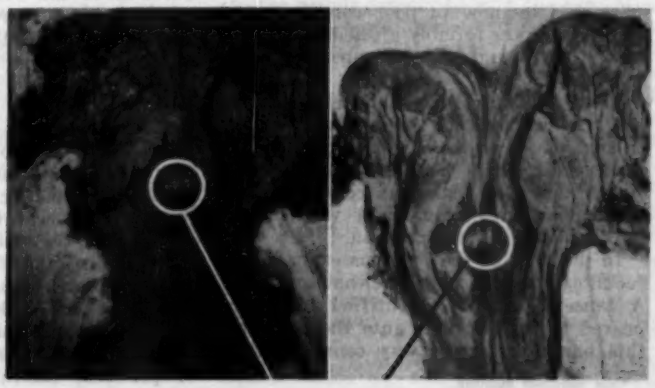

Fig. 1—Showing the area through which the fetus is believed to have escaped from the uterus into the peritoneal cavity.

Prior to this examination, two other veterinarians had examined the mare and palpated an almost full-term fetus *in utero*.

A small sample of urine was obtained, and the results of the analysis were as follows: blood, ++++; color, dark amber; specific gravity, NSQ;* and transparency,

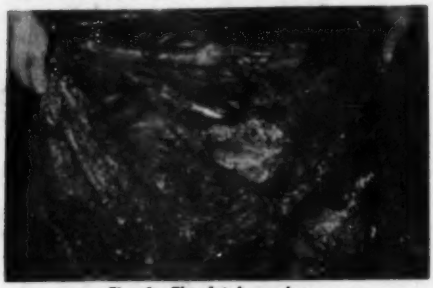

Fig. 2—The fetal envelope.

cloudy to viscid. Microscopic findings were as follows: epithelial cells, few; erythrocytes, numerous; leucocytes, numerous; crystals of calcium carbonate, numerous.

On August 13, the owner reported that the urine was normal in appearance.

In consultation with the two above mentioned veterinarians, it was decided that interference was not justified at this stage. If the service date were correct, the fetus was probably undergoing mummification and, in view of the greatly improved condition of the mare, it was believed that its expulsion would occur.

On October 8, the mare was again admitted, with a history of recurrent attacks of colic over the past two weeks. The mare was by now in poor condition, and fluid feces were forcibly ejected in streams from the rectum. The temperature was normal.

When the animal was viewed from the rear, a pronounced "peak" was evident on both sides of the abdomen just behind the costal arch. External palpation revealed that the peak was composed of a large, hard, resisting mass which could not be moved in any direction.

In the light of the previous examination, rectal exploration was somewhat confusing. A tense band of unidentified tissue appeared to descend deep into the abdomen; this band was in no way connected with the genital tract, for it was possible to withdraw the entire uterus into the pelvis. A large, dead fetus was palpated lying transversely across the anterior floor of the abdomen. The suggestion was made that the case was one of ectopic pregnancy but, in view of the diagnosis made two months earlier, this finding seemed unlikely.

It was decided to perform cesarean section but, because of the now toxic condition of the subject, a very grave prognosis was offered.

*Not sufficient quantity.

MODUS OPERANDI

The left flank and adjacent abdominal region was prepared for surgery. Under chloral hydrate anesthesia, an incision 14 in. long was made extending downward and forward, parallel to the costal arch. The muscles were incised in the same direction. The peritoneum was firmly adherent to the underlying viscera and, after incision of the former, these adhesions were broken down until the "wall" enclosing the fetus was exposed sufficiently for the extraction of the latter.

A 12-in. incision was made through this modified "uterus" and the fetus removed, along with a quantity of blood-stained fluid. The membranes were firmly adherent to the lining of this necrotic and cystic "uterus," and their removal was a tedious task. After forty minutes of careful dissection, most of the membranes were freed and cut away, only a small portion being left at the bottom of the sac.

Suction apparatus was employed to remove all fluid present in the numerous saccules of the "foal bed." Examination of this structure revealed the presence of firm adhesions on the ventral and posterior surface, between it and the adjacent viscera.

Closure of the now empty sac proved extremely difficult to achieve, due to the necrotic nature of the tissue involved. Through and through catgut sutures were used and a plastic drainage tube, 1½ in. in diameter, was fixed to the lower commissure of the wound prior to closing the musculature and skin. The external portion of the drainage tube was sutured to the lower part of the skin wound.

During the course of the three-hour operation, the mare received 1,200 cc. of 7 per cent chloral hydrate solution and,

approximately, 4,000 cc. of 6 per cent dextrose solution.

The mare died nine and one-half hours after completion of the operation.

AUTOPSY

Multiple adhesions which involved not only the foal bed but also the spleen and portions of the colon were revealed. An attempt to trace the remainder of the fetal membranes was futile because they disappeared into a mass of intestinal adhesions.

Uterus.—This organ was of normal size for a nonpregnant mare. The mucosa appeared normal. On the ventral surface of the organ, just anterior to the internal *os* of the cervix, was a thinned area of uterine wall which, macroscopically, gave the appearance of scar tissue. No evidence of fetal membranes was found either inside or near the outside of the genital tract.

Oviducts and Bursae.—These appeared normal.

Ovaries.—The left ovary was quiescent in that no graafian follicles were present and one remnant of luteal tissue was found deeply embedded in the ovarian stroma.

The right ovary presented one follicle, 1.0 cm. in diameter, and a pear-shaped corpus luteum 1.8 cm. long with a central hemorrhagic zone.

Histopathologic Sections.—Histopathologic sections of the uterus and fetal envelope were made. Regarding the uterus, the report indicated, "This section of uterus showed an area of thinning and some hyperemia, but there is no evidence of scar tissue in the area." Report of examination of the fetal envelope stated "This structure was composed of fibrous tissue with an extensive collection of leucocytes, fibrin, and cellular debris on the surface. The section was rather hyperemic and well vascularized."

CONCLUSIONS

There seems little doubt that the case was one of secondary ectopic pregnancy. Attention was naturally drawn to the scarlike portion noticed on the ventral wall of the body of the uterus, but microscopic examination of sections of this tissue showed that scar tissue was not apparent. This factor does not, however, preclude the possibility that the rupture of the uterus had occurred at that point for, according to Stander,[1] "Williams was of the opinion . . . that the uterus heals by regeneration of the muscle fibers and not by scar tissue." Schwarz and his associates, again quoted by Stander, conclude that healing occurs mainly by the proliferation of fibroblasts. It appears that, judging by this single case, Williams' theory is the more applicable of the two.

UNANSWERED QUESTIONS

1) Why did the mare show no constitutional signs at the time of rupture of the uterus?

2) Would earlier medical induction or surgical intervention have been justified?

[1]Stander, H. J.: Textbook of Obstetrics. 3rd rev. D. Appleton Century Co., Inc., New York, (1945): 1186.

Harder's Gland in the Dog

The January JOURNAL (p. 16) carried an article on this subject and the views expressed by the authors have been analyzed by Drs. M. E. Miller and R. E. Habel of the Department of Anatomy at Cornell. They say:

"The authors of 'The Harderian Gland of the Dog in Chronic Ectopia' have chosen to imply that Sisson's description of the gland of the third eyelid is not clear, or even that it is not correct. They undertake to clarify the situation by a 'survey of the literature' which makes no reference to the abundant German literature, written by competent veterinary anatomists, on the subject of the third eyelid in the dog.

"Some years ago, when we were preparing the manuscript for 'A guide to the Dissection of the Dog,' we encountered much confusion in the literature relative to the glands associated with the eye. Miss Purington, our librarian, traced the origin of the name "Harderian" to its original meaning. In short, we found this to be true: In the dog, there is a mass of scattered lymphoid tissue on the concave side of the third eyelid. We determined this to be lymphoid by several serial sections. We also found a gland at the apex of the cartilage of the third eyelid. In some animals there is a deeper gland associated with the cartilage of the third eyelid. This is the gland that is truly known as Harder's gland.

"The authors [H. J. Werner and J. H.

Roberts] complain that, until recently, the harderian gland has received only casual mention. Harder's original article was published in 1694, and was referred to in the 'Guide' already mentioned. Also, a complete description of the glands of the third eyelid was published in Ellenberger's 'Handbuch der Vergleichenden Mikroscopischen Anatomie der Haustiere' (vol. 3, 1906-1911, pp. 536-539).

Fig. 1—Harder's gland in the deer—an illustration taken from Harder's original article published in 1694. A = the eyeball; b = seton in orifice of duct on membrana nictitans; c = intrusa; d = the superficial gland usually described; e = duct connecting new (Harder's) gland to the one usually described; f = new (Harder's) gland; g = adductor muscle (rectus medialis) of the eye; h = optic nerve.

—*Acta Eruditorum Lipsiae*, 1694-1695

"The pertinent literature supports Sisson's statements: (a) All domestic animals have a *superficial* gland of the third eyelid. This is not Harder's gland. It surrounds the cartilage of the third eyelid. The cells are serous in the horse and cat, mixed (mucous and serous) in the ox, sheep, and dog, and mucous in the pig. (b) Harder's gland is the *deep* gland of the third eyelid. It is a separate structure, and is attached to the deep end of the superficial gland. It is very large in the deer, in which species it was described by Harder. It does *not* occur in the horse, dog, or cat. It is not clearly separated from the superficial gland in the ox. It is distinct in the pig.

"There has been considerable controversy over the names of the glands associated with the third eyelid. In the light of the original report by Harder, and the complete description by Ellenberger, the pig is the only domestic animal having a true harderian gland. The authors of the article on page 16 do not resolve the controversy; in fact, it is not clear whether they refer to the lymphoid tissue of the superficial gland in the dog, or to the deeper mixed gland. The references cited by them are not adequate to establish the name which they have used to designate this gland in the dog."

[The editors have not checked the German texts referred to, and pass this information along as a guide to anatomists who desire to work out their own explanations.—ED.]

CLINICAL DATA

Clinical Notes

The over-all percentage of tested cattle reacting to the agglutination test has decreased each year since 1946.—*B. T. Simms, D.V.M., Washington, D.C.*

Anthrax antiserum is rapidly becoming a historic biologic product, being replaced by the antibiotic agents and the sulfonamide drugs, says *Jen-Sal Journal* (Sept., 1950).

Q Fever from Wool and Hair.—Anthrax can no longer claim to be the only "wool sorter's disease," since an outbreak of Q fever occurred in a Philadelphia wool and hair processing plant.

Mastitis Treatment.—Treatment of mastitis without a management program is doomed to failure. Sound treatment requires periodic laboratory testing.—*Holm and Eveleth, Bull. North Dakota Agric. Exper. Sta., Sept.-Oct., 1950.*

Even in well-managed dairy herds, losses of calves limit the opportunity of selecting only the most desirable animals for breeding.—*E. E. Ormiston, University of Illinois.*

Cysticercus bovis is found most commonly in the muscles of mastication, the heart, tongue, and diaphragm; also the esophagus and various skeletal muscles. More rarely the parasite is found in the lungs, liver, lymph nodes, kidney, pancreas, and bladder.—*Vet. Rec., Aug. 19, 1950.*

Radioactive penicillin was used by Rowlands, Rowley, and Smith (*J. Chem. Soc.* (London), 1949: 405-407) to measure the amount of penicillin taken up by sensitive bacteria and to trace the fate of penicillin when administered to experimental animals (*Nuclear Sci. Abstr.* 4, July 31, 1950: 644).

Leptospirosis in Calves.—Leptospirosis occurs in calves in most of the dairying districts of Queensland (*Austral. Vet. J.*, Sept., 1950: 246).

Clinical and subclinical avitaminosis A are important in veterinary practice, because low resistance to infections and dubious fertility are constant results.

Carbon Tetrachloride Poisoning.—This onetime sheet anchor for ascariasis in pigs is known to damage the kidneys, liver, and heart in degrees corresponding to the intake.—*From Bol. A.M. de Puerto Rico San., April, 1950.*

Raising calves in individual, portable pens that are moved each week to clean ground has proved effective in preventing infectious and parasitic diseases.—*Hoard's Dairyman, Aug. 10, 1950.*

A physician reported that when he used thiamine chloride because of fleas, he found not only that it was effective against those insects but also that mosquitoes no longer bit him.—*Current M. Digest, Aug., 1950.*

The simplest and best method of controlling nervous horses for minor procedures (clipping, shoeing, dressing wounds, floating teeth) is the administration of chloral hydrate *per os*. Doses of 1.5 to 1.75 oz. in a warm water drench make a horse quite "sleepy" in about twenty minutes.

New Stain for Fungus.—A new staining technique which improves differential diagnosis of skin and tissue disease, particularly in recognizing fungus infections, has been announced by workers in the School of Medicine at the University of Pennsylvania.

A Report of Bovine Anaplasmosis in Minnesota

H. J. GRIFFITHS, D.V.M., Ph.D., and W. J. HADLOW, D.V.M.

St. Paul, Minnesota

IN THE STATES along the Canadian border, the problem of anaplasmosis in cattle has received but little consideration. Veterinarians in the northern states have generally thought of this disease as being present only in the southern and western states; it has, therefore, been regarded only of academic interest in the north. Anaplasmosis has been known to exist on the continent for about twenty-five years and has been reported from at least 28 of the United States of America.

With modern methods of transportation and the movement of cattle from one part of the continent to another, the opportunity for distribution of anaplasmosis carrier animals has been greatly increased. Individuals that have recovered from the disease remain carriers. As such, each must be considered a potential source of infection until slaughtered. There is no doubt that carrier animals have been shipped into the north central states. Many of these animals would probably never demonstrate a recurrence of the disease and would be sent to slaughter; others may have been known as animals which did not do well but were never sufficiently sick to warrant exhaustive examinations and the formulation of a specific diagnosis by the attending veterinarian. Other carrier animals may have remained among susceptible cattle and passed on the disease to local stock by mechanical transfer or by means of a biologic vector. If such occurred in the northern part of the United States, it is conceivable that a diagnosis of anaplasmosis might have been confused with other diseases. This can readily be understood in view of the fact that blood examinations and specific laboratory techniques must be employed if a correct diagnosis is to be accomplished. It is probable that anaplasmosis has been present in Minnesota in past years; however, it was not until early in 1950 that a definite diagnosis of bovine anaplasmosis was made. The diagnosis was confirmed by animal inoculation and reproduction of the disease.

In September, 1949, some 400 head of Hereford cattle were brought to southwestern Minnesota from several western states. These animals were bled for a brucellosis test and about a month later, several animals became sick and showed a marked anemia. More than a dozen head of cattle died, and those that recovered gradually regained condition and finally appeared in good health. In January, 1950, the cattle were again bled and a month later a number of animals became sick, showing a clinical syndrome very similar to that noted three or four months previously. A few more head of cattle died at this time; 2 living animals were obtained and kept under observation for the purpose of making a correct diagnosis. These 2 animals were markedly anemic and very weak. They exhibited intermittent diarrhea, the feces were dark in color and the red blood cell count dropped as low as 1,500,000 per cubic millimeter. An 18-month-old heifer was inoculated with 5 cc. of blood from 1 of these suspected anaplasmosis carriers. By the twenty-third day postinoculation, this individual showed a rise in temperature which reached 103.9 F. four days later. This rise was accompanied by a noticeable decline in the red blood cell count. By the twenty-seventh day postinoculation, the animal had a red blood cell count of 2,550,000/1 cmm. and a hemoglobin reading of 5.1 Gm./100 cc. During this animal's illness, no clinical evidence of disease was ever very marked. The individual was slightly off feed, but at no time would such illness have been observed with any more of a comment than that the animal was somewhat "off color." Throughout the infection, Anaplasma-like bodies were never observed in the blood stream in large numbers. The animal made an uneventful recovery and was later slaughtered. The type of disease noted in this animal could possibly be

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classed as the mild form of anaplasmosis rather than the peracute or acute form of the disease. To further confirm the diagnosis, a splenectomized calf was inoculated with blood from one of the original suspect carrier animals. In this calf, the typical anaplasmosis syndrome was observed and a clear-cut case of the disease was reproduced. At the height of the fever, marginal bodies in the red blood cells were easily demonstrated. In order to supplement our observations, blood from the suspect animals was submitted to workers in the Bureau of Animal Industry. These investigators produced anaplasmosis by experimental inoculation and, after detailed examination of a series of slides, confirmed the diagnosis of anaplasmosis.

This brief report is presented not for the reason that the information included is in any way unusual, but with the intention of bringing this condition to the attention of the practitioner in the north central states. For those unfamiliar with this disease, the differential diagnosis may present a problem.

CHARACTERISTICS OF ANAPLASMA MARGINALE

As a general rule, Anaplasma bodies are seen within the red blood cells. They stain reasonably well with Wright or Giemsa blood stains, but at all times it must be remembered that great care must be exercised when staining in order to demonstrate Anaplasma bodies. They appear as round or oval, more or less irregular bodies usually located near the margin of the red blood cell. They range in size from 0.2 to 0.9 μ in diameter. Usually, they are seen singly, though they may be in pairs, and sometimes three or four may be found in one red blood cell. The number of cells infected varies with the severity of the disease and the type of infection. In mild forms of the disease, less than 1 per cent of the red blood cells may be infected; whereas in the acute form, as many as 60 per cent of the cells may be invaded. The exact nature and significance of these bodies is still in dispute, and these forms are still placed in the category of "organisms of uncertain zoölogical classification."

MEANS OF TRANSMISSION

The transmission of anaplasmosis is accomplished in several ways. The natural method is considered to be by an insect vector of which ticks are the chief culprit. Flies and mosquitoes have also proved to be vectors. The fly transmitters are mostly Tabanidae, more commonly known as the horseflies. It is well to note that deer are capable of acting as carriers of this agent in the natural state. These reservoir hosts increase the possibility of maintenance of this disease in an area, once it has been introduced.

Although the natural means of transmission is by insect vectors, many outbreaks have been traced to the careless work of individuals. Such outbreaks can usually be attributed to the failure of individuals to employ the general methods of asepsis prescribed for routine operations carried out in practice. Such operative procedures may be castration, dehorning, blood-testing, ear-tagging, or any other procedure which may permit the transfer of minute amounts of blood from one animal to another. These methods may be intentional or unintentional on the part of some persons; for example, the goading of animals or stabbing with a pitchfork has been known to transmit the infective agent. Human carelessness has undoubtedly contributed greatly to the spread of this disease and, until such time as more attention is paid to asepsis in the field, the human negligence factor is probably of greater import in the spread of this disease than is the insect vector.

FORMS OF THE DISEASE

As in many other diseases, anaplasmosis manifests itself in several forms which have been classified according to the symptoms that are noted. In the mild type, which is not unusual in calves, symptoms may be so slight that, in all probability, they may be unobserved. The peracute and the acute types are usually seen in mature animals and are characterized by rapid onset, marked symptoms, and high mortality. This form may readily be confused, clinically, with such diseases as forage poisoning, mineral poisoning, anthrax, hemorrhagic septicemia, and other infectious diseases. The chronic form of the disease may assume a more protracted nature; the animal gradually recovers, though the period of convalescence may be weeks or even months.

Generally speaking, the physical symp-

toms observed may be many and varied. Any of the following may be seen: slight loss of appetite, loss of condition, roughened coat, elevated temperature, constipation, animal may appear stiff and disinclined to move around, the eyes may become pallid and somewhat icteric, and in dairy cattle milk secretion may cease. Symptoms may be of such severity that the animal is extremely sick or they may be so mild as to go unnoticed by the owner or stockman. The individual animal may be considered as being slightly off color and not doing well.

Blood Changes and Diagnosis

As far as the blood picture is concerned, as the disease progresses, the red cells are rapidly reduced in number and the hemoglobin content is decreased. The red cell count may drop as low as 1,000,000 red blood cells per 1 cmm. If such occurs, one would expect to see a definite clinical picture.

The diagnosis of this disease presents a problem to the practitioner, especially in regions where the disease is not enzoötic. The diagnosis is usually dependent upon the finding of marginal bodies in the red cells on microscopic examination; however, their absence does not necessarily rule out anaplasmosis. Marginal bodies are usually thought to appear in the blood about the time when the body temperature begins to rise, starting to disappear again with the fall of temperature and finally disappearing completely. As the disease progresses, a change in the cellular blood picture usually appears which may be manifested by anisocytosis, polychromatophilia, basophilic stippling, and the appearence of normoblasts.

The microscopic examination of blood smears from carrier animals is of little value as an aid to diagnosis. Except in lately recovered cases, the examiner may experience extreme difficulty in finding enough specifically characteristic bodies to warrant a positive diagnosis. The use of the complement-fixation test now perfected by the Bureau of Animal Industry promises an adjunct to aid in the diagnosis of anaplasmosis, especially where carrier animals are concerned.

A sure method of diagnosis is by the reproduction of the disease after inoculation of a susceptible animal with the blood of a suspect animal. The susceptible animal should be at least 1 year old, although a younger animal which has been splenectomized may be used satisfactorily. The period of incubation after experimental inoculation seems to be dependent on the size of the infective dose administered. Generally speaking, marginal bodies do not appear in the blood stream much before two to three weeks; a few days later, physical symptoms may be noted. After mechanical transmission, symptoms may take a month or more to appear. In case of insect transmission, the period elapsing before the appearance of marginal bodies in the host's blood is quite variable. After the initial inoculation, several months may elapse before any evidence of clinical disease is seen.

On autopsy of a suspected animal, all external membranes are inclined to be anemic and, in many instances, may also be icteric. The blood is thin and watery, the muscles appear pale, and lymph nodes may be large and edematous. The spleen is usually considerably enlarged and the cut surface appears dark and jamlike. Scattered petechial hemorrhages may be seen and the colon and rectum may contain hard pellets of fecal material which may be mucus covered; the mucus may also show some flecks of blood. The gall bladder may or may not be markedly distended, its contents being a viscid greenish-brown bile. Hemoglobinuria is not usually seen, though it has been reported by some investigators.

Brucella Isolation

Injection of small numbers of Brucella organisms into the yolk sacs of 5-day chicken embryos is suggested as offering "optimum conditions for recovering Brucella from the blood stream."—*Pub. Health Rep., Sept. 15, 1950.*

Amphotropin (Bayer's brand of hexamine camphorate) gave encouraging results in dogs over 1 year of age suffering from so-called hard pad disease but not yet showing signs of severe nervous involvement. The report (*Vet. Rec.*, Aug. 5, 1950), which was based on observations in 35 cases, was the second published account of this line of treatment.

Equine Serum Penicillin Levels Following Injection of Depo*-Penicillin

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THE ABILITY of procaine penicillin suspended in peanut oil, with 2 per cent aluminum monostearate as a dispersing agent, to maintain penicillin blood levels for prolonged periods in both man and animals has been well described. Robinson[1] reported that a single intramuscular injection of 300,000 units of this preparation maintained therapeutic penicillin levels for seventy-two hours in 90 per cent of the persons so treated. Davidson, Wiley, and Troost[2] reported that depo-penicillin in doses of 100,000 and 300,000 units administered intramuscularly to dogs maintained, on the average, penicillin levels of 0.10 and 0.14 units per cubic centimeter of plasma, respectively, for a 96-hour period. Miller and co-workers[3] reported similar findings in dogs after checking this type of preparation against some of the earlier dosage forms of penicillin. Bryan and Drury[4] obtained 96-hour plasma levels averaging 0.07 units per cubic centimeter after single intramuscular injections of depo-penicillin in doses ranging from 500 to 2,000 units of penicillin per pound of body weight in the dairy cow. Morse[5] has reported on the prolonged effects of the various doses of procaine penicillin G in oil with aluminum monostearate in cattle.

In horses, however, Doll *et al.*,[6–10] who have made extensive studies on antibiotic serum levels in horses, cattle, and sheep, observed that a similar repository form of procaine penicillin produced low penicillin serum concentrations of shorter duration. In view of this report, it was deemed advisable to determine the penicillin blood levels in horses following the administration of depo-penicillin.

METHOD AND MATERIAL

In order to make the data comparable, the techniques used by Doll's group were followed as closely as possible. However, it was necessary to change the assay method by employing *Bacillus subtilis*, the test organism used by the Food and Drug Administration (F.D.A.) instead of *Streptococcus equi*.

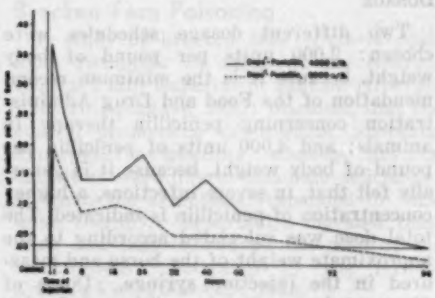

Fig. 1—Depo-penicillin, average serum levels in horses

The product used in this study was depo-penicillin which consists of crystalline procaine penicillin G micropulverized and suspended in peanut oil containing 2 per cent w/v of the dispersing agent, aluminum monostearate. Each cubic centimeter contains 300,000 units.

Crystalline procaine penicillin G is a highly potent antibacterial agent effective against a wide variety of pathogenic organisms. It is the water-insoluble procaine salt of benzyl penicillin containing one molecule of penicillin G combined with one molecule of procaine base. The addition of aluminum monostearate as a dispersing agent imparts to the suspension a property known as thixotropy which aids in maintaining the small particles of crystalline procaine penicillin G well dispersed and in keeping the mixture in an easy-flowing fluid state. Aluminum monostearate also increases the ability of the preparation to repel water which, in turn, delays absorption and prolongs the effect of penicillin.

Eight apparently normal barren mares of grade Thoroughbred and crossbred breeding at the Upjohn Richland Farms were used in this study. The weights of the mares were estimated in a manner comparable to a practicing veterinarian in treating sick horses. Although the mares had been in a feedlot, they were necessarily confined to box stalls during the entire time of this project.

From the Department of Veterinary Medicine, Medical Division (Stocking, Davidson); and from the Bacteriology Department, Research Division (Troost, Nook, Henshaw), the Upjohn Company, Kalamazoo, Mich.

*This is the trademark of the product produced by the Upjohn Company.

They were given grain, free access to hay, and were led to water twice a day. Consequently, they were much more active than indisposed horses would be, which would tend to hasten the absorption and excretion of the penicillin.

assayed by the Food and Drug Administration *B. subtilis* serial dilution method (controlled). On the normal blood, drawn the day previous to penicillin administration,

TABLE 1—Penicillin Serum Levels: Depo-Penicillin Intramuscularly, 2,000 Units per Pound of Body Weight

Horse (No.)	Weight (lb.)	Total dose in units	Control	Units of Penicillin per cc. of Serum									
				1 hr.	4 hr.	8 hr.	16 hr.	24 hr.	32 hr.	40 hr.	48 hr.	72 hr.	96 hr.
211	1,000	2,000,000	0	0.25	0.25	0.06	0.125	0.125	0.06	0.06	0.06	0.03	0.0
167	1,200	2,400,000	0	0.125	0.125	0.125	0.06	0.06	0.03	0.03	0.03	0.03	0.03
176	1,075	2,150,000	0	0.125	0.06	0.03	0.06	0.03	0.03	0.03	0.03	0.03	0.0
182	1,225	2,450,000	0	0.25	0.125	0.125	0.125	0.125	0.06	0.06	0.06	0.03	0.0
Average				0.187	0.14	0.085	0.093	0.85	0.045	0.045	0.045	0.03	0.0075

DOSAGE

Two different dosage schedules were chosen: 2,000 units per pound of body weight, because it is the minimum recommendation of the Food and Drug Administration concerning penicillin therapy in animals; and 4,000 units of penicillin per pound of body weight, because it is generally felt that, in severe infections, a higher concentration of penicillin is indicated. The total dose was calculated according to the approximate weight of the horse and measured in the injection syringe. Doses of 10 cc. or less were given in one injection and doses of greater size were divided evenly and injected in two different sites. Following aseptic precautions, all injections were made deep in the musculature of the lateral cervical region. Local, untoward reactions were exhibited in only 1 mare as a transitory swelling at the injection site.

tests were run for *B. subtilis* inhibitory factors to check against the possibility of false positive reactions. No inhibitory factors were found to be present. Penicillinase controls were also run on each sample to further check the presence or absence of *B. subtilis* inhibitory factors and thus provide another means of excluding false penicillin levels. No inhibitory factors were found in these controls.

Table 1 shows the response obtained with a dose of depo-penicillin, 2,000 units per pound of body weight as measured by penicillin serum level assays. All 4 horses exhibited penicillin concentrations of 0.03 units per cubic centimeter of serum at seventy-two hours. One horse maintained this level for at least ninety-six hours after administration of the minimum F.D.A. recommended dose of penicillin for animals.

Table 2 presents the details of the results obtained with a dose of depo-penicillin,

TABLE 2—Penicillin Serum Levels: Depo-Penicillin Intramuscularly, 4,000 Units per Pound of Body Weight

Horse (No.)	Weight (lb.)	Total dose in units	Control	Units of Penicillin per cc. of Serum									
				1 hr.	4 hr.	8 hr.	16 hr.	24 hr.	32 hr.	40 hr.	48 hr.	72 hr.	96 hr.
147	1,350	5,400,000	0	0.5	0.25	0.125	0.25	0.5	0.125	0.125	0.06	0.03	0.03
239	1,125	4,500,000	0	0.25	0.125	0.125	0.125	0.06	0.06	0.06	0.06	0.03	0.03
220	1,150	4,600,000	0	0.25	0.125	0.06	0.06	0.06	0.06	0.125	0.125	0.06	0.03
101	1,150	4,600,000	0	0.5	0.5	0.25	0.125	0.125	0.125	0.25	0.06	0.125	0.03
Average				0.375	0.25	0.14	0.14	0.186	0.093	0.14	0.076	0.061	0.03

RESULTS

Blood samples for assay were taken from the jugular vein the day preceding and 1, 4, 8, 16, 24, 32, 40, 48, 72, and 96 hours after the administration of the penicillin. The samples were allowed to clot and the serums removed and frozen until all bleeding was completed. The samples were then

4,000 units per pound of body weight. From this table, it is obvious that serum penicillin concentrations of 0.03 units were maintained in all 4 horses for a full 96-hour period.

For comparison, the average results presented in tables 1 and 2 are plotted in graph form (fig. 1). The penicillin concen-

tration shows, in general, a steady decline during the 96-hour sampling period after the administration of depo-penicillin to the mares. The rise and fall in the penicillin absorption rate as indicated on the graph by the serum penicillin levels is felt to be due to (1) the biologic variation commonly observed in determining antibiotic concentrations in blood of human beings, laboratory animals, and domestic animals; and (2) to the variability of the activity of the mares during different periods of the study. Being normal horses, accustomed to feedlot activity, the mares were at all times more ambulatory than sick horses. This is believed to increase the speed of penicillin absorption generally, particularly during the feeding hours.

CONCLUSIONS

By using the widely accepted Food and Drug Administration method of assay, employing *Bacillus subtilis* as the test organism, it was found that depo-penicillin in doses of 2,000 to 4,000 units per pound of body weight sustained measurable penicillin serum concentrations in horses for ninety-six hours.

These penicillin levels are comparable to those obtained in the human, the canine, and the bovine species.

With one exception, which was transient in nature, there were no untoward reactions at the injection sites.

In severe systemic infections, or in combating infections of less sensitive organisms, even greater or more frequent doses of penicillin than those given here may be required. However, due to the many conditions in horses where penicillin therapy is indicated, and to the undesirable features in the hospitalization of this species, the prolonged penicillin serum levels obtained with depo-penicillin will be particularly valuable to the large animal practitioner.

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Bracken Fern Poisoning

A study of bracken fern (*Peteris aquilina*) poisoning in cattle at the Georgia Coastal Plain Experiment Station (*Georgia Vet.*, July-August, 1950) disclosed that the clinical phenomena (depression, anorexia, hyperpyrexia, bleeding mucosae, anemia, enteritis) were due to thiamine deficiency; at least, the symptoms responded to thiamine therapy. Reportedly, ingested thiamine and that formed by the flora of the rumen was inactivated by the fern.—*Georgia Vet., July-Aug., 1950.*

[In regions of Wisconsin, Minnesota, and the Canadian Northwest, where this fern grows luxuriantly we have heard farmers and veterinarians declare that it was not injurious to livestock, abundant as it was in some of the hay crops. British veterinarians are less optimistic and the Georgia study revealed that drought-depleted pastures are a positive hazard after rains. The fact that the avitaminosis may not declare itself until three or more weeks after the fern-containing forage was withheld appears to enter into the argument. Moreover, investigators have been further thrown off guard by the scattered morbidity in the affected herds.]

Ring Test Antigen

A method of preparing ring test antigen through the use of tetrazolium with the live organisms is described by R. M. Wood, M.D. (Science, *112*, July 21, 1950: 86). The new antigen is prepared much more readily than the old, is claimed to be more stable, more uniform in color intensity, and more sensitive.

Salmonella in Dogs and Cats of the Los Angeles, Honolulu, and Bermuda Areas

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IN DISCUSSING the results of their survey for the presence of Salmonella in dogs of Michigan, Wolff, Henderson, and McCallum[1] point out that these animals should be regarded as reservoirs for potential infection in man. Their report led to the present investigation.

METHODS

Fecal material for culture was obtained by a rectal swab except in a few cases when it was collected after defecation. At small animal hospitals, the specimens were taken from living animals, but cultures secured at animal shelters were from animals just killed with gas.

The swabs were placed in tubes containing an enrichment medium (selinite F or tetrathionate) and incubated at 37 C. Plates containing S.S. agar were subsequently streaked and, in Honolulu, eosin methylene blue (e.m.b.) medium was also used. Nonlactose fermenting colonies were subcultured to Kligler's iron agar. When reactions typical of Salmonella were obtained, the cultures were tested for their ability to hydrolyze urea. If positive, the organism was considered to be Proteus and discarded. Others were transferred to dextrose, lactose, mannitol, sucrose, salicin, and xylose broths and kept for one month if the fermentation was negative. The gram, indol, and Voges-Proskauer reactions, and motility, were also ascertained. Cultures with the characteristics of Salmonella were then sent to the Salmonella typing center, California State Division of Laboratories.

EXPERIMENTAL RESULTS

Incidence of Salmonella.—During the fall of 1948, 107 dogs and 17 cats were examined in the Los Angeles area and, in the winter of 1949, an additional 152 dogs and cats were tested. During the spring of 1949, 125 fecal specimens from cats in Honolulu, and 41 from dogs in Bermuda, were cultured for Salmonella.

Of 300 dogs, 17 (5.66%) were excreting these organisms, as were 4 (2%) of the 200 cats examined. No dogs were tested in Honolulu as it was learned such a study was already in progress. The Bermuda series was small; the lack of an animal shelter made it difficult to obtain specimens during the few weeks of residence. The findings are presented in table 1.

TABLE 1—Incidence of Salmonella Isolated from Dogs and Cats in Los Angeles, Honolulu, and Bermuda

Area	Dogs (No.)	Number of Salmonella in Los Angeles	Honolulu	Bermuda
Hospital A	100	3	---	---
Hospital B	12*	6	---	---
Hospital C	41	---	---	1
Shelters	147	7	---	---
Total	300	16 of 259	---	1 of 41
	Cats (No.)			
Hospital A	25	0	---	---
Shelters	175	1	3	---
Total	200	1 of 75	3 of 125	---

*Defecated feces.

Animals at the hospitals of veterinarians were not necessarily ill, as many examined were present for grooming. If an animal had dysentery, it was so noted. The three positive cultures obtained from hospital "A" in Los Angeles were from pups, 1 of which had a bloody diarrhea. In this instance, a second culture was made and *Salmonella anatum* was obtained. Also, a Salmonella organism was isolated from a young dog at hospital "B." No positive cultures were derived from 15 pups at the animal shelters, but 1 of 44 kittens carried this organism.

Incidence of Proteus.—As Craige[2] presents observations linking dysenteries in dogs with Proteus infections, the frequency of these organisms was noted in all animals with the exception of those in Bermuda. Of 259 dogs, 41.0 per cent had Proteus in their intestinal flora, as did 29.5 per cent of 200 cats examined. It is thus apparent that this organism is frequently present in

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The author expresses her appreciation to Raymond Stewart, student, for carrying out the tests on the first series done in Los Angeles; to Dr. O. A. Bushnell of the University of Hawaii and to Dr. R. Shaw of the King Edward VII Memorial Hospital, Hamilton, Bermuda, for the laboratory facilities made available; and to Dr. J. W. Sutherland in Bermuda, and veterinarians and others in Los Angeles and Honolulu. In addition, acknowledgement is made to the members of the staff of the Division of Laboratories, California Department of Public Health, who typed the cultures.

the feces of dogs and cats as well as in those of man.

Morgan[3] points out that *Proteus vulgaris* tends to become more prominent in enrichment mediums. Although on subculture from the enrichment medium the colonies of Proteus did not spread over the S.S. plates as they did on e.m.b. medium, they were a definite nuisance. Being nonlactose fermenters, they were frequently picked for transfer to the slants of Kligler's iron agar medium.

It may be mentioned that two paracolons, 29911 Stuart and Wheeler, were isolated in dogs of Los Angeles, and paracolon 32011 from this species in Bermuda.

Distribution of Salmonella Types.—Table 2 shows that nine types were obtained from 17 of 300 dogs and that 4 of 200 cats harbored four strains. Group B of the Kauffmann-White classification was represented by *Salmonella typhimurium, Salmonella san diego, Salmonella derby, Salmonella budapest;* group C-1 by *Salmonella montevideo, Salmonella oranienburg, Salmonella tennessee;* group C-2 by *Salmonella newport;* and group D by *Salmonella enteritides. Salmonella anatum* and *Salmonella meleagridis* belonged to group E-1, and *Samonella minnesota* represented group F among the types isolated.

It is believed this is the first report of the rare type *S. budapest* being found in a dog.

DISCUSSION

A comparison of these findings with those given by Edwards, Bruner, and Moran[4] and also by Wolff, Henderson, and McCallum[1] show that *S. anatum, S. meleagridis, S. minnesota, S. newport,* and *S. oranienburg* have previously been found in dogs of the United States. Levine, Enright, Ching, and Tanimoto,[5] in discussing Salmonellosis in the Hawaiian Islands, mention *S. montevideo* as responsibile for five food poisoning outbreaks there, and also report that this type was isolated from human carriers, rodents, dried eggs, and dogs. The occurrence of *S. derby, S. oranienburg,* and *S. typhimurium* in cats has also been reported.[4]

Felsenfeld and Young[6] as well as others[4,5] found *S. typhimurium* the most frequent type, occurring in man and a wide range of other hosts in the areas they have investigated. However, in the present series of dogs and cats, it was isolated only once. It is possible that dogs and cats from rural areas might show a higher incidence of Salmonella infection. Fowl constitute the largest reservoir of these organisms in the United States,[7] while swine and rodents[4] also harbor them. Therefore, the opportunity for rural animals to contact these sources, directly or indirectly, appears greater than for those in urban areas, even though Kintner[8] points out that the rations of dogs frequently contain Salmonella. It is also likely that the incidence in this series would have been higher if the inoculum had consisted of 2 or 3 Gm. of material. Such a quantity was seldom obtained by rectal swab from living animals.

TABLE 2—Salmonella Types Isolated from Dogs and Cats in Los Angeles, Honolulu, and Bermuda

Salmonella	Dogs		Cats	
	Los Angeles	Bermuda	Los Angeles	Honolulu
S. anatum	4	—	—	—
S. budapest	—	1	—	—
S. derby	1	—	1	—
S. enteritidis	—	—	—	1
S. meleagridis	1	—	—	—
S. minnesota	4	—	—	—
S. montevideo	1	—	—	—
S. newport	1	—	—	—
S. oranienburg	5	—	—	—
S. san diego	—	—	—	1
S. tennessee	1	—	—	—
S. typhimurium	—	—	—	1
Animals examined	259	41	75	125
Per cent positive	6.2	2.4	1.3	2.4

With hardly an exception, the types isolated from dogs and cats in this study have been found in persons in southern California[9] or in other areas of the United States[4-6,10] as the cause of enteric disease. Dogs and cats which are discharging Salmonella are potential sources of infection for man, themselves, and other animals. This is in agreement with the suggestions of Edwards, Bruner, and Moran[4] that household pets may be responsible for some infections, especially in children. However, so far as this investigator is aware, no outbreak of salmonellosis in man in the United States has been traced to the consumption of food contaminated by dogs or cats.

A recent editorial[11] sums up the situation in regard to this infection very well, "The usual sources of human salmonellosis in

the United States are human carriers, especially food handlers; insufficiently cooked pork and fowl; eggs; water; food contaminated during storage by rodents; domestic pets, usually dogs, and handling of infected farm animals. The over-all mortality is low, approximately 6 per cent.

"The prevention of salmonellosis by appropriate hygienic measures is the most effective way of eradicating the disease. Such measures include a clean water supply, proper food inspection, periodic examination of food handlers, and the treatment of sick animals."

SUMMARY

1) Fecal cultures from 17 of 300 dogs and from 4 of 200 cats were positive for Salmonella.

2) Twelve types were found including the rare one, *Salmonella budapest*.

3) Four of the 17 dogs discharging Salmonella were young animals. One of these had clinical evidence of infection.

4) Proteus occurred with high frequency in the intestinal flora of both species of animals.

5) The implications arising from the presence of Salmonella in dogs and cats is discussed.

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Carbon tetrachloride gave excellent results against sheep nematodes, especially hookworms (*Bunostomum trigonocephalum*). Small therapeutic doses (1 to 3 cc. in mineral oil) at monthly intervals for as long as nine months did not cause chronic liver damage.—*Vet. Rec., July 1, 1950.*

Ova of Filarid Worms Never Escape

The January, 1951, JOURNAL got off to a bad start when, on page 2, the abstractor of an article on *Dirofilaria immitis* remarked (and the editors overlooked it): "The route of escape of the ova from the host's body is not mentioned, important as that seems". Actually, the ova of filarid worms never "escape" from the body of the host, as a number of critical readers have already advised us. The chairman of the Committee on Parasitology (Dr. R. D. Turk) suggests clarification by publishing the following paragraph from "Clinical Parasitology" by Craig and Faust (3rd ed., p.305):

Criteria of a True Filaria Worm

A filaria worm (Superfamily, Filarioidea) lives as an adult in the tissues or body cavities of a vertebrate host. The females produce eggs which are partially embryonated before birth. Just before, or at the time of oviposition the embryos uncoil and become delicate snake-like organisms called *microfilariae*. If the egg shell elongates to accommodate itself to the elongated embryo, the latter is said to be "sheathed;" if the shell ruptures and sets free a naked embryo, the latter is "unsheathed." While circulating in peripheral blood or other cutaneous tissues these microfilariae are ingested by blood-sucking arthropods. In appropriate arthropods the microfilariae migrate out of the digestive tract into the hemocele, and in suitable locations (frequently the thoracic muscles) metamorphose into first, and later into more advanced larval stages. The mature larvae migrate into and down the hemocelic cavity in the labium and escape into the vertebrate host's skin when the arthropod takes its next blood meal.

Also on page 43 of the January JOURNAL, in the item on magnesium sulfate in acetonemia, there is a very manifest error which says that 200 injections were made in front and behind the shoulder. This should read two injections.

Treatment of Lymphosarcoma with Nitrogen Mustard

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Enormous strides in the treatment of animal malignancies, which perhaps parallel those in man, have been accomplished through radiotherapy. Chemotherapy for these conditions has been largely neglected by veterinarians. However, if the case detailed in this article is an illustration of what can be achieved through the use of nitrogen mustard compounds, there is reason to believe that they may provide a distinct advance in the treatment of lymphomas and leucemias, relieving the symptoms and perhaps prolonging the life of the patient.

The *beta*-chloroethylamines or nitrogen mustards have been used since 1942 in the treatment of lymphomas as well as other malignancies. In the human patient, although no malignancy has been eradicated by this chemical agent, some degree of temporary control has been effected in the clinical course of Hodgkin's disease, the lymphosarcomas, chronic leucemias, polycythemia vera, and transitional cell carcinomas.[1] However, in other malignant new growths such as melanosarcoma, multiple myeloma, metastatic mammary and cervical carcinoma, the nitrogen mustards have been of little or no value.

Case History.—The patient, a 3-year-old female, blond Cocker Spaniel, was brought to a veterinary clinic in March, 1949. The client complained that the dog was losing weight and had intermittent periods of anorexia. A tonic was administered but the patient showed no improvement. On May 5, 1950, the dog entered our hospital for observation. The animal showed symptoms of severe emaciation, with all the palpable lymph glands, especially the submaxillary, mammary, and inguinal, markedly enlarged. Bilateral keratitis was present. The patient suffered from severe pruritus. Temperature and respiration were normal. There was difficulty in swallowing due to the enlarged lymph glands. A tentative diagnosis of lymphatic leucemia was made.

Appreciation is expressed to Drs. Milton Ende and Philip Jacobson for their invaluable assistance, and to Drs. Norman Ende and Regina Beck for their help with the histopathology of this case.

Pathology.—A lymph node measuring 3 by 5 cm. was removed from the right cervical region. This was reported as a lymphosarcoma. The normal architecture of the node was lost, with destruction of the lymphoid follicles (fig. 1).

There was a homogeneous cellular infiltration of lymphocytes with little stroma left (fig. 2). Radiographic examination of the chest was negative.

Course in Hospital.—On May 5, the animal was given 250 cc. of 5 per cent aminosol (Abbott) with 5 per cent dextrose, and 5 cc. of solu-B (Upjohn). This was repeated every other day until May 15 when we were able to obtain nitrogen mustard. The dog was fed beef and liver concentrate, eggs, and milk every day.

Injections of nitrogen mustard were given (0.1 mg./kg.) intravenously on May

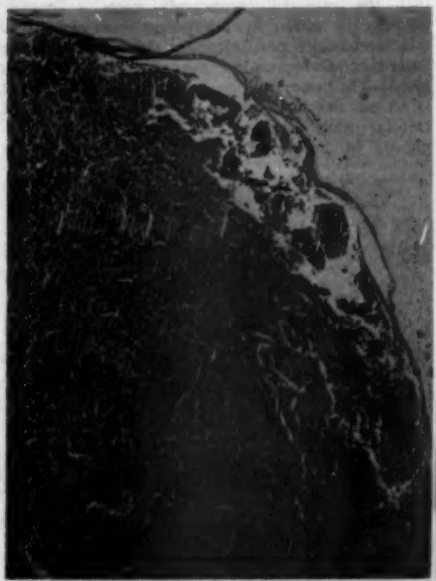

Fig. 1—Cervical lymph node showing normal architecture lost, with destruction of the lymphoid follicles. x 100.

16 and 17. Nausea and vomiting occurred one hour after administration. This was alleviated with pyridoxine. Pronounced shrinkage of the cervical and inguinal lymph node masses occurred within one week. Symptoms of weakness gradually disappeared, and the dog was able to stand

up and bark. The appetite increased greatly and she gained 3 lb. after the first course of treatment. Another injection was given (0.2 mg./kg.) on May 24 and this was repeated on May 31. When discharged on June 7, the patient had a few palpable lymph glands in the submaxillary region but partial or complete resolution occurred in all lymph glands.

It is interesting to note the effect of the lymphosarcoma on the skin. The chronic eczema, from which the animal had been suffering for over a year, had disappeared. When the dog was reëxamined one month later, no evidence of eczema remained, except scar tissue from self-mutilation. Seventy days after treatment was instituted, there was no evidence of relapse, although it is known that this may occur at any time.

Pharmacology.—It has been shown by Reinhard that the mustard compounds exert a specific nucleotoxin action by interfering with chromosomal mechanisms and mitotic division in a manner somewhat analogous to the effects of roentgen rays. The susceptibility of cells to the lethal effect of the mustards is related to the rate of cellular multiplication and presumably this explains, in part, the vulnerability of the bone marrow and lymphatic tissues to these compounds.[2]

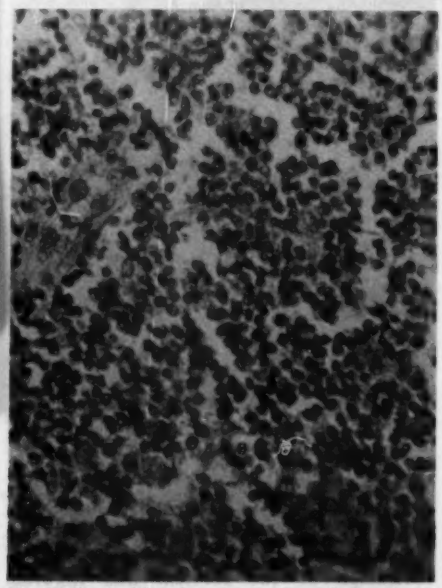

Fig. 2—Cervical lymph node showing a homogeneous cellular infiltration of lymphocytes with little stroma left. x 400.

Methods.—The compound methyl bis *beta*-chloroethylamine hydrochloride (Merck & Co.) was used in the case reported. This was obtained in crystalline form, in vials containing 10 mg. each. The dosage schedule was 0.1 mg. per kilogram of body weight per day for two consecutive days. The following week, the dose was increased to 0.2 mg. per kilogram for one injection and the same dosage repeated once the following week. The material in each vial was dissolved in 10 cc. of n-saline, producing a concentration of 1 mg. per cubic centimeter and the calculated dose was withdrawn into a 5-cc. syringe. Since the nitrogen mustards can produce severe thrombophlebitis, an intravenous infusion of n-saline was started, and the solution was injected into the lumen of the rubber tubing. This method gave greater assurance that there was no leakage around the needle and there were fewer local reactions. Nausea and vomiting developed one hour after injection. The nausea was controlled by administering 50 mg. pyridoxine orally thirty minutes before injection.

Occurrence.—Lacroix and Riser cite 52 cases of lymphosarcoma of the dog and come to the conclusion that: (1) this condition is a disease of young dogs and the incidence decreases with age; (2) the cases are evenly divided between the sexes; (3) it affects short-haired dogs more often than long-haired ones; (4) tumors found on the ears and face accounted for almost half the neoplasms.[3]

In a study of 700 canine neoplasms by Mulligan, lymphosarcoma predominated in the Scottish Terrier, although it was found in the Fox Terrier, Boston Terrier, and German Shepherd.[4] In a further study by Mulligan, he found that lymphosarcoma usually occurs in dogs 6 years of age or older, more commonly in males and spayed females; has a rapidly developing course and fatal termination, always involving the lymph nodes, often the liver and spleen, and less commonly other organs and tissues.[5]

Comment.—There seems to be clear indication for use of nitrogen mustard compounds, especially the methyl bis derivative in the treatment of lymphomas, Hodgkin's disease, and in some cases of chronic leucemia.[6]

The use of nitrogen mustard can be alternated with radiation. One of the most useful features of nitrogen mustard has been its effectiveness in alleviating the advanced disease which proves to be roentgen resistant.[7] When the malignancy is

localized, radiation is the preferred treatment. If metastasis has occurred, nitrogen mustard can be used fairly satisfactorily. Combination of both measures should be used in refractory cases.

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Parasites and Profits

Building their discussion around the fact that the ultimate purpose of keeping livestock is economic gain, the authors (Todd and Hansen, *Am. J. Vet. Res.*, Jan., 1951) assess the problem of parasitism from an entirely new angle. Assuming that animal owners can or should regard resistance to the effects of parasites in terms of ability to reserve greater energy for growth in the presence of exposure to infection, the following suggestions are made:

The presence of mature (egg-laying) parasitic worms in a host is not prima-facie evidence of clinical helminthiasis, because clinical ascariasis due to mature worms is rare under natural conditions.

Ability of the host to gain weight properly is challenged at least three times: at exposure, while immature stages are establishing themselves, and after maturity of the parasites.

Greatest host damage is caused by activity of the immature stages of the parasites.

Severity of symptoms is often in inverse ratio to egg production — calves showing less severe symptoms following exposure had relatively higher egg counts — incidentally, they also gained most consistently.

The authors postulate that maximum efficient production by livestock should be based on prevention of exposure to infection and not upon treatment of parasitized animals. Hence, the first animals which should be treated in any program are those showing the fewest symptoms, for they provide the reservoir of infection from which later and more susceptible animals may be parasitized. This is predicated on the presence, under natural conditions, of universal exposure and near universal, subclinical infection.

In the face of this universal exposure, it seems desirable to think in terms of tolerance rather than resistance, because the energy employed by animals resisting infection prevents maximum efficient weight gains. (The accepted criteria for estimating resistance are ability of the host to restrict the percentage of parasites which mature from a given number of infective ova, and to reduce the size of the mature parasites—possibly with a restriction of egg-laying ability. Tolerance, on the other hand, implies ability of the host to make greater and more efficient gains by using a greater proportion of the energy to this end, and lesser proportion to combat of the parasites.)

The authors believe that when parasites are judged in the light of their ultimate effect on gains in weight, and not in terms of the effects upon the parasites themselves, the above analysis is logical and points the way to a more effective plan for reducing the losses from parasitism.

Treatment of Algae Poisoning.—Intravenous injection of 60 cc. of thionitrite, stronger (Pitman-Moore), and oral administration of thionitrite tablets every four hours, together with ½ gal. of mineral oil, resulted in recovery of 18 animals showing stupor, unconsciousness, and other symptoms of algae poisoning.—*Canad. J. Comp. Med. and Vet. Sci. (June, 1950).*

Sodium fluoride at the rate of 1 per cent mixed in the feed for one day every three weeks is suggested as a satisfactory method of keeping pigs free from *Ascaris lumbricoides suis* while being raised on contaminated soil. Similar use of phenothiazine at the rate of 0.2 Gm. per pound of body weight once every three weeks was found to be unreliable.—*J. Agric. Univ. Puerto Rico (April, 1947).*

Experimental Q Fever in Cattle – Epizoötiologic Aspects

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Hamilton, Montana

DERRICK, in 1937, described Q fever as a new human disease entity occurring in Queensland, Australia.[1] Further studies proved the causative agent to be a Rickettsia which is now known as *Coxiella burnetii*. During the next five years, 152 naturally occurring cases were investigated, and association with livestock, particularly cattle, was considered to be a major factor predisposing to infection.[2]

In 1938, Davis and Cox reported the isolation of the Q fever Rickettsia from ticks of the species *Dermacentor andersoni* collected near Missoula, Mont., in the spring of 1935.[3] Further studies by Cox suggested that human infection with this organism was occurring in several western states.[4]

During 1946, two outbreaks of Q fever occurring among slaughterhouse workers were reported. In the outbreak in Amarillo, Texas,[5] epidemiologic studies indicated that a single shipment of cattle was the source of human infection. Calves or sheep were considered as the probable sources of infection in the Chicago outbreak.[6] Thus, two species of domestic animals were incriminated as sources of human infection, but information about the disease in either sheep or cattle was not available. After Q fever was recognized in southern California, and again associated with cattle,[7] experimental studies of the disease in domestic animals began.

These studies were initiated by Parker and associates at the Rocky Mountain Laboratory, Hamilton, Mont., in mid-1947 for the purpose of obtaining basic knowledge of the epizoötiology, pathogenesis, pathology, and symptomatology of Q fever in cattle. At this time, only the epizoötiologic aspects of experiments conducted to date will be considered.

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MATERIALS AND METHODS

Detailed descriptions of protocols and results of experiments presented in this paper are included in previous publications[8-10] or in manuscripts now in preparation for publication. However, a general discussion of methods is appropriate. Cattle were procured from local dairymen in the vicinity of Hamilton, Mont., an area in which natural infection in dairy cattle has not been demonstrated.[11] Only healthy animals, free of tuberculosis and brucellosis, were used. Preinoculation specimens were tested serologically and by guinea pig inoculation to preclude the experimental use of cattle spontaneously infected in the laboratory. Usual methods of dairy husbandry were followed in caring for the cattle, with the exception that most of the experimental animals were housed in isolation barns. Sterile rubber gloves were worn by milkers for personal protection, and also to preclude spontaneous infection of cattle through contact with infectious milk.

Attempts were made to reproduce the disease in cattle through inoculation or controlled exposure by various routes. Secretions, excretions, and other specimens were tested for infectiousness by inoculation of each specimen into 2 or more guinea pigs. Approximately thirty days after inoculation, guinea pigs were bled and their serums were tested for complement-fixing antibodies against *C. burnetii*. The presence of antibodies in the guinea pig serum was evidence that the specimen injected contained Q fever rickettsias. During the period experimental studies were conducted, guinea pigs which were inoculated with specimens from cows which failed to become infected served as controls to detect spontaneous infection in the colony. Less than 1 per cent of 1,555 such guinea pigs became spontaneously infected. Furthermore, individual specimens which yielded unusual positive results were retested for confirmation.

EXPERIMENTAL STUDIES

The results of early experimental studies suggested that cattle were rather resistant to infection with *C. burnetti*. Derrick and co-workers in Australia[2] attempted to infect 2 calves by subcutaneous inoculation with a suspension of infectious guinea pig tissues. *Coxiella burnetii* was recovered from the spleen and liver of 1 of the calves slaughtered on the fourth day postinocula-

tion, and the other calf developed specific agglutinins. In 1947, Parker *et al.*[8] attempted to reproduce the disease in 4 heifers by intranasal, intravenous, and intravaginal inoculation and by feeding contaminated bran. Large doses were employed in these attempts, yet all 4 heifers were refractive to infection.

After *C. burnetii* was recovered from milk of dairy cattle in Los Angeles,[12] an attempt was made to reproduce the disease in 2 lactating cows by inoculation via the teat canal or by injecting the organism (Nine Mile strain) into the mammary gland substance. These cows continued to shed rickettsias in their milk for an extended period, and complement-fixing antibodies against *C. burnetii* appeared in their serums. Milk of uninoculated quarters remained free of *C. burnetii*. Blood, urine, feces, and nasal washings of cows so infected were tested and determined to be noninfectious for guinea pigs.

A third cow[9] was inoculated by introducing a mixture of semen (artificial insemination) and yolk sac culture of a California strain into the cervical canal. *Coxiella burnetii* appeared in the milk of a single quarter on the sixth day postinoculation and persisted for 426 days. During this period, milk from the other three quarters was noninfectious for guinea pigs. Q fever rickettsias were demonstrated in the urine of this cow for eight days postinoculation; the infectiousness of the urine was considered to be a contamination with residual inoculum remaining in the vagina. Since the blood of this cow was consistently noninfectious for guinea pigs, the source of infection in one quarter was difficult to explain. At that time, it was postulated that infection may have resulted from contamination of the teat orifice with infectious urine.

In another experiment,[9,10] planned primarily to study the symptomatology and pathology of Q fever in cattle, the following observations are of interest. Four cows were inoculated via the teat canal of two quarters, each quarter of which received 5 ml. of a 10 per cent suspension of a yolk sac culture of *C. burnetii* (California strain). The blood of these cows was infectious for five days after exposure. Thus, noninoculated quarters were bathed in infectious blood for a considerable period but only one of the eight uninoculated quarters produced infectious milk. Cows were slaughtered on the fifth, eleventh, twenty-second, and sixty-third days postinoculation. Tests of tissues collected at autopsy indicated that *C. burnetii* did not persist very long in organs other than the mammary gland. With the exception of some lymph nodes, extramammary tissues of the cow killed on the twenty-second day postinoculation were noninfectious for guinea pigs. The ease with which infection could be produced by inoculation via the teat canal, the fact that only one of eight uninoculated quarters became infected, and its brief persistence in extramammary tissues, suggested the disease to be a localized infection of the mammary gland. The possibility that natural infection was acquired by entrance of the organism through the teat canal was considered. In the milking process, either hand milking or machine milking, the mechanical transfer of infectious milk from cow to cow is possible. Therefore, a similarity of epizoötiology between this disease and streptococcic mastitis was postulated.

Studies by Huebner and co-workers[12, 13] of naturally infected dairy cattle in California gave additional support to this thesis. In early tests of herds, there was no serologic evidence of infection in either bulls or heifers; complement-fixing antibodies against *C. burnetii* were demonstrated only in the serums of mature cows with functional mammary glands. The absence of clinical illness and the failure to recover *C. burnetii* from blood, urine, and feces of cows shedding Rickettsia in their milk suggested a local infection of the udder.[12]

In the spring of 1949, an experiment was initiated to test the possibility of cow-to-cow spread through the milking process. Five cows, from 3 to 6 years of age, were exposed five times a week by dipping the teats in infectious milk (milk from experimentally infected cows, containing from 5 to 1,000 or more guinea pig-infectious doses per 1 ml.) before milking. Three* were exposed for eighteen and one half weeks and the remaining 2 were exposed for ten and one half weeks. At the end of this period, none of the cows had become infected, so exposure both before and after milking was started. Again, after nineteen and one half weeks of such contact with infectious milk, no infection was produced. Occasionally,

*One cow dry for eight weeks, unexposed.

guinea pigs inoculated with milk of these cows become serologically positive. However, retests of these milk specimens were consistently negative; hence, the original results probably represented spontaneous infection in the guinea pigs. Serologic tests of these cows, conducted at weekly intervals, were consistently negative. Thus, it appears that cow-to-cow spread through the milking process is improbable among cows with normal udders. It is appreciated that teat injuries and bacterial mastitis which may be predisposing factors to infection by this route were not evaluated in this experiment.

Jellison *et al.*[14] reported the isolation of *C. burnetii* from ticks of the species *Otobius megnini* Dugés, which had been collected from cattle in infected dairies in the Los Angeles area. To date, transmission attempts[9,13] with this tick have been essentially negative. Of 2 nonpregnant, lactating cows which were hosts to infected nymphs, only 1 developed a specific rise in complement-fixation titer, but *C. burnetii* was not isolated from either blood or milk. Two further attempts to transmit the disease using larvae, which were progeny of infected females, were difficult to evaluate. All ticks which attached and fed, and were later tested at varying stages, proved to be noninfectious when injected in guinea pigs. Thus, it is possible that the latter 2 cows were not exposed to infected ticks.

In view of the negative results obtained in the preceding experiments, other possible routes of infection were explored. Using a California strain, 2 lactating cows were exposed by supraconjunctival instillation of 0.1 ml. of a 10^{-4} dilution of yolk sac culture. This exposure was repeated in sixty-one days. Inoculation of guinea pigs with blood and milk, and serologic tests of the serums of these cows, revealed no evidence of infection.

Intradermal inoculation of 2 bull calves, each of which received 1 ml. of a 10 per cent yolk sac culture (Nine Mile strain) demonstrated that the dermis of cattle readily supported growth of *C. burnetii*. These calves developed clinical illness, and local skin lesions, consisting of edema, induration, and central necrosis were produced at the site of inoculation. The blood of these calves was infectious for guinea pigs for about five days postinoculation and, subsequently, these calves became serologically positive.

In view of these results, a pregnant, lactating cow was inoculated intradermally with 1 ml. of a 10 per cent yolk sac culture (California strain). The following observations are pertinent: (1) A clinical illness, characterized by high fever, depression, and anorexia, developed; (2) a local skin lesion was produced at the site of inoculation; (3) *C. burnetii* appeared in the blood and persisted through the seventh day postinoculation; (4) Q fever rickettsias were shed in the milk of all quarters for fifteen days; (5) abortion occurred on the seventh day after exposure, and *C. burnetii* was recovered from the placenta; (6) the urine, particularly during the fourth week postinoculation, was infectious; and (7) frequent tests of feces were consistently negative. The presence of the organism in the urine could represent either elimination of the organism in the urine or contamination with postparturient uterine discharges. It is apparent that there is a rapid proliferation of Rickettsia at the site of inoculation with secondary dissemination to the body through the blood stream. It is difficult to explain the temporary localization in the mammary gland of this cow while in a previous experiment, in cows which also experienced a rickettsemia, localization in the udder was an exception. Possibly, physiologic changes associated with stage of pregnancy and lactation influence susceptibility.

An epidemiologic study of 300 human cases[16] in the Los Angeles area revealed that 45 per cent resided within a quarter mile of a dairy or livestock yards. This finding suggested a possible air-borne spread. In view of this, it was desirable to determine whether cattle could be infected by inhalation of *C. burnetii*. A crude mask was devised which permitted inspiration only through a tube to which an atomizer was attached and permitted expiration only through another tube. With this device, a pregnant, lactating cow was exposed to the aërosol spray produced from 5 ml. of a 10^{-2} dilution of yolk sac culture (California strain). Because of the short distance between the aperture of the atomizer and the opposite wall of the tube, it was estimated that less than 50 per cent of the culture was nebulized. The following observations

are of interest: (1) Daily tests of blood for infectiousness during a period of twenty-one days postinoculation were consistently negative; (2) complement-fixing antibodies against *C. burnetii* appeared in the serum of this cow on the thirteenth day postinoculation but dropped to an insignificant level at parturition, which occurred thirty-six days after exposure; (3) although a full-term, normal calf was born, *C. burnetii* was recovered from the placenta; (4) during the month following parturition, urine and particularly vaginal washings were infectious for guinea pigs; (5) Q fever rickettsias persisted in nasal secretions for thirteen days following exposure; (6) frequent infectivity tests of feces and milk, collected both before and after parturition, were consistently negative; and (7) no symptoms of illness were manifested.

Another lactating cow was exposed by the same method and dosage on the twenty-first day after parturition. As determined by the complement-fixation test, antibodies appeared in the serum of this cow on the twelfth day after inoculation and were still present in significant titer on the forty-seventh day, the last day tested. Specimens of milk, urine, feces, and vaginal washings collected at varying intervals during twenty-three days postinoculation have been tested in guinea pigs and proved to be noninfectious. Daily tests of blood for infectiousness during a period of twenty-one days postinoculation were consistently negative. Studies are being continued on this animal to determine the cause of the specific rise in complement-fixing antibodies. In these experiments, it was impossible to exclude infection by the digestive tract, as rickettsias on the muzzle and external nares no doubt gained entrance to the mouth through prehensile movements of the tongue.

DISCUSSION

In these preliminary studies, rather large doses of *Coxiella burnetii* were employed to exclude the question of adequate challenge should infection not occur. When infection resulted, the course of the disease was probably influenced by the initial exposure to such large numbers of rickettsias. It is obvious that a statistical analysis of experimental data is impossible at this time, because of the insufficient number of animals. However, in reviewing these data, certain trends are apparent which confirm field observations of naturally occurring bovine infections, or suggest approaches to epizoötiologic studies in the field.

In spite of the regularity with which infection followed the introduction of *C. burnetii* into the udder via the teat canal, it is improbable that the organism gains spontaneous entrance by this route. The results of the experiments, wherein the teat orifice of lactating cows was repeatedly exposed, suggest that hand milking is not an important factor in the spread of Q fever among cows with normal mammary glands. As was related previously, the role of possible predisposing factors such as bacterial mastitis and teat injuries could not be evaluated.

The infections which followed intradermal inoculation, genital exposure, and inhalation of *C. burnetii* suggest that the mammary gland infection is a mere localization of hematogenous origin. The recovery of *C. burnetii* from the placenta of 2 cows confirms the observations of Luoto and Huebner.[17] In view of the results of exposure by inhalation, the air-borne spread of the disease should be considered as a natural means of spread among cattle.

The localization of *C. burnetii* in the mammary gland and pregnant uterus suggests a comparison with brucellosis, a disease in which this also occurs. In both diseases, the infected placenta and postparturient uterine discharge are potent sources of infection. Calves under breeding age are relatively resistant to brucellosis. Experimentally, calves of similar age manifest variable resistance to Q fever. In both diseases, experimental exposure of pregnant cattle by various routes results in the localization of the infection in either the uterus, placenta, or mammary gland.

SUMMARY

The epizoötiologic aspects of the results of experimental studies of Q fever in cattle were discussed. Cattle were readily infected by introduction of the organism into the mammary gland. Early experimental data and field observations suggested an epizoötiology similar to streptococcic mastitis and, therefore, the milking process

might be an important factor in its spread. However, later studies, in which cattle were infected by intradermal inoculation, genital exposure, and inhalation, suggested a different epizoötiology. In cattle, certain features of Q fever are quite similar to those of brucellosis.

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The Use of Streptomycin and Dihydrostreptomycin for Infectious Sinusitis in Turkeys

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Hitchner[1] reported on the efficacy of streptomycin on turkeys experimentally infected with the causative agent of infectious sinusitis. Other investigators[2,3] have reported on the efficacy of this drug in treating sinusitis in field trials.

A flock of 3,000, 4-month-old turkeys, with approximately 750 infected birds, became available for study in September, 1949. The infection had been present since the poults were 6 weeks old and before they were turned out on range. A flock of 2,500 birds that had been raised on the second floor of the same house and had been ranged about ½ mile apart did not take the infection. The flock owner had treated the affected birds with sulfaguanidine and sulfamerazine without success.

In this study, streptomycin was prepared by dissolving 1 Gm. in 10 cc. of sterile distilled water, so that each cubic centimeter contained approximately 100 mg. of streptomycin. The desired dose was injected into the affected sinus, without draining, using a 10-cc. glass syringe with a 20-gauge, 1-in. hypodermic needle.

A summary of the streptomycin treatments is given in table 1. Trials a and b were carried out in a large broiler house. Trial c was conducted on the range. The controls were not carried after the second observation, since the flock owner requested treatment of all infected birds. Approximately, 750 birds were treated, but this report includes only the birds on which complete information was obtainable.

The sinuses were classified as to degree of swelling as follows: 1, a slight swelling containing a small amount of fluid; 4, a large swelling which, in most cases, caused

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The streptomycin (calcium chloride complex) and dihydrostreptomycin hydrochloride were supplied by Merck and Co. Inc., Rahway, N. J.

the closure of the eyelids; 2 and 3 were gradations between 1 and 4. All classifications were made by the author. It was not known at the time of classification whether the bird was a control or treated bird, except in the case of the last observation when all the birds had been treated. The birds were picked at random for treatment, except in the case of the 200-mg. dose trial a, when some of the more seriously infected sinuses were selected for treatment. In trial a, observation 2, the infected sinuses were re-treated with the same dose of streptomycin. In trials b and c, observation 2, the controls were treated and the others re-treated with 100 mg. of streptomycin or dihydrostreptomycin, as indicated. The percentage of recovery was based on individual sinuses. The recovery rate would be slightly higher on a bird basis.

Death loss in this flock amounted to 1 or 2 birds per day before treatment, and a large percentage were culls. Following treatment, however, only 5 birds were lost, and the number of culls was reduced materially.

Streptomycin was highly effective in controlling sinusitis in the flock observed in these studies. Treatment with 100 mg. of streptomycin proved as effective as doses of 150 or 200 mg. Dihydrostreptomycin used on the second observation was as effective as streptomycin. The turkeys in trial a (table 1) represented the more severely affected birds in this study. The lower recovery rate of the birds receiving 200 mg. of streptomycin in trial a indicates that there is no advantage in increasing the dose in the more severely affected sinuses. In trial b, there were no significant differences between the three concentrations of streptomycin.

TABLE 1—Summary of Streptomycin Treatments

Treatment		Trial	Observation 1 At time of treatment	Observation 2 13 or 17 days after observ. 1	Observation 3 10 or 20 days after observ. 2	Recovery (%)
100 mg. streptomycin	No. inf. sinuses		76	26	9	88.2
	Average swelling of sinuses	a	2.81	0.53†	0.06	
		b	2.34	0.64‡	0.21	
150 mg. streptomycin	No. inf. Sinuses		243	79	22	90.9
	Average swelling of sinuses	a	2.72	0.61†	0.16	
		b	2.24	1.04‡	0.23	
		c	1.70	0.30¶	0.09	
200 mg. streptomycin	No. inf. sinuses		78	27	16	79.5
	Average swelling of sinuses	a	3.27	1.11†	1.04	
		b	2.28	0.40‡	0.20	
Controls	No. inf. sinuses		254	224*	...x	11.9
	Average swelling of sinuses	a	2.43	2.03		
		b	2.02	1.87‡	0.51**	
		c	1.60	1.49¶	0.35**	

* = controls treated; † = infected sinuses given same dose of streptomycin; ‡ = infected sinuses given 100 mg. of streptomycin; ¶ = infected sinuses given 100 mg. of dihydrostreptomycin; ** = had received treatment; x = third observation not included in percentage of recoveries of controls, since they were treated on second observation.

The infection in this flock was decreasing, as evidenced by the decrease in swelling of the sinuses and the fact that 11.9 per cent of the controls recovered in less than three weeks. It was noted that a few of the sinuses classified as 4 recovered spontaneously. It is not known how effective streptomycin would be in flocks where infection was increasing. In these trials, there was no tendency for swelling to reappear after recovery following streptomycin treatment.

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Antibiotic Treatment of Swine Dysentery

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ALTHOUGH swine dysentery was reported by Whiting, Doyle, and Spray at the Purdue Agricultural Experiment Station in 1921[1]; and the isolation of a Vibrio associated with dysentery was reported by Doyle in 1944,[2] there has been found no effective treatment for the disease. With this in mind, several attempts to treat groups of dysenteric pigs with streptomycin* alone, streptomycin and aureomycin in combination, and aureomycin** alone have been made.

METHODS

In this study, 101 pigs of different ages were used. Nineteen shoats were exposed by feeding finely ground colon of pigs which showed typical symptoms and lesions of swine dysentery. The other 82 pigs were naturally occurring cases. Of the above groups, 51 pigs served as untreated controls. The principal groups treated were:

Group 1.—Streptomycin was administered to 4 pigs individually by means of a dose syringe. Treatment was started as soon as a mucohemorrhagic diarrhea appeared in this group.

Group 2.—Streptomycin was mixed in the feed and fed as a thick slop to 5 pigs at the first appearance of diarrhea within the group.

Group 3.—Streptomycin was administered, *per os*, as to group 1, to 5 pigs at the appearance of symptoms in each pig.

Group 4.—Streptomycin and aureomycin were administered, one immediately succeeding the other, by means of a dose syringe, to 4 pigs at the appearance of symptoms in the group.

Group 5.—Aureomycin was mixed with the feed and fed to 9 pigs at the appearance of a mucohemorrhagic diarrhea in at least 4 pigs of the group.

Group 6.—Streptomycin was mixed in the feed, as in group 2, and fed to 11 pigs at the appearance of a mucohemorrhagic diarrhea in at least 4 pigs of the group.

Group 7.—Aureomycin was administered in capsules, by balling gun, to 8 pigs at the appearance of symptoms in each pig.

Group 8.—Aureomycin and streptomycin were mixed in the feed and fed to 4 pigs as a group at the first sign of symptoms.

The first three groups were experimentally infected, and the remaining five groups were naturally occurring cases. Of the 51 control animals, 5 were experimentally infected.

In those animals given streptomycin by dose syringe, the antibiotic was dissolved in 40 cc. of distilled water, pH 7.0. In all cases, the initial dose of streptomycin was 1 Gm. per pig under 100 lb. of body weight, and 1½ Gm. per pig weighing up to 150 lb. Succeeding doses were ½ the initial dose and were given every twelve hours for six and one-half days.

Aureomycin, when administered with a dose syringe, was put in solution in sterile distilled water and brought to a volume of 40 cc. In all cases in which aureomycin was used, the initial dose was computed to 25 mg. per pound of body weight. The maintenance dosage was ½ the initial dose and was administered every twelve hours for four and one-half days.

The same relative dosages were used when the two antibiotics were administered in combination.

Blood samples were collected sporadically from the aureomycin-treated pigs and assayed.

Fecal samples were collected sporadically from the streptomycin-treated pigs and assayed. Levels were determined by a paper disc modification[3] of the cup-plate technique described by Herrell and Heilman.[4] Previous pharmacologic studies indicated that insignificant amounts of streptomycin are absorbed from the intestinal tract of pigs when administered orally and that the greatest quantity is passed in the feces.

RESULTS

In all cases, there was an improvement in the character of the feces of the treated animals within forty-eight hours and a return to normal in three to four days after the start of treatment, regardless of the antibiotic used.

The use of either antibiotic alone, or in combination, did not entirely prevent the recurrence of symptoms. The time of recurrence following the cessation of therapy varied from thirteen to twenty-six days. The severity of the recurrence was generally less in the treated animals, although 2 pigs, 1 in group 5 and 1 in group 6, were

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**Aureomycin was supplied through the courtesy of Lederle Laboratories, Pearl River, N. Y.

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From the Department of Physiology and Pharmacology, College of Veterinary Medicine, The Ohio State University, Columbus, Ohio (Smith); and from the Purdue University Agricultural Experiment Station, LaFayette, Ind. (Salisbury and Doyle).

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very severely affected and subsequently died following retreatment of each group. Postmortem findings in each of these 2 cases indicated that death was due to dysentery. One treated pig in group 7 died, but postmortem examination revealed hydrothorax, hydropericardium, and dilated heart without the presence of a colitis or cecitis. Death probably was not due to swine dysentery but to a chronic heart condition existing before the above trials were undertaken.

The surviving control pigs made slow weight gains and were subject to frequent recurrences of a severe mucohemorrhagic diarrhea typical of swine dysentery. Among the 51 control pigs, there were 14 deaths caused by swine dysentery. In the naturally infected pigs, the death from dysentery of 2 treated animals represented a loss of 6 per cent; whereas the death of 12 pigs in the control group represented a loss of 26 per cent. In the experimentally infected pigs, 2 of the 5 controls died, while all 14 treated animals survived.

Blood levels of aureomycin in pigs treated orally by dose syringe, balling gun, or in the feed were sufficiently high to inhibit the Vibrio as indicated by *in vitro* studies.[3] Levels varied from 1.0 to 4.0 μg. per milliliter of blood serum in most cases, depending upon the interval between administration of the antibiotic and drawing of the blood sample. The assay method used was that described by Dornbush and Pelcak.[4]

Fecal levels of streptomycin were sufficiently high after oral administration to inhibit the Vibrio.

FIELD TRIAL

One field trial was made with 130 pigs. Thirty small pigs were used as principals and 100 older shoats were used as untreated controls. These pigs were kept under similar conditions in the same barn, but were entirely separated. Before treatment, there was a death loss of 10 pigs in the control group and several pigs in the principal group were showing typical symptoms of dysentery. One affected pig in the principal group was killed and the postmortem findings were typical of dysentery.

The principals were treated as a group with dihydrostreptomycin in the feed, at the rate described previously, for a period of seven days. After three days, there was no clinical evidence of dysentery present, but the high incidence in the nontreated controls continued. The animals were observed on the final day of treatment and again thirty days later. At that time, the principals had not had a recurrence of dysentery. The control group, however, continued to show symptoms of dysentery throughout the observation period.

DISCUSSION

Both streptomycin and aureomycin reduced the severity of the symptoms of swine dysentery. However, the beneficial effect was not always lasting. Each antibiotic may be of value by decreasing the severity of symptoms and reducing death losses. In these trials, the death loss in treated animals was less than in untreated animals. The fact that 14 pigs of the 51 controls died of swine dysentery indicates that the severity of the disease was comparable to what occurs naturally.

SUMMARY

1) Aureomycin and streptomycin, singly or in combination, were administered orally to 50 pigs infected with swine dysentery. Fifty-one similar pigs infected with swine dysentery were not treated.

2) The use of these antibiotics, singly or in combination, apparently reduced the severity of symptoms and decreased the death losses. The feces of treated animals usually became normal in three to four days. However, the recurrence of symptoms was not always prevented.

3) Of 50 treated animals, naturally and experimentally infected, 2 (4%) died of dysentery. Of 51 untreated animals naturally and experimentally infected, 14 (about 27%) died of the disease.

4) One trial with dihydrostreptomycin was made under farm conditions. The feces of the treated animals became normal after three days and there was no recurrence of symptoms during an observation period of thirty days. Untreated pigs continued to show symptoms of dysentery during the thirty days of observation.

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Azoturia in a Heifer

A 20-month-old heifer was found making futile efforts to get on her feet. The clinical examination revealed a flabby posterior paralysis, tense and hard lumbar musculature, normal temperature, and the urine, obtained by compression of the bladder, was dark and reddish. There was no response to local and general medication. The autopsy disclosed numerous degenerative, cooked-like lesions of the triceps, crural, and psoas muscles showing peripheral gelatinous infiltrations. The author concluded that the condition was pathologically in agreement with azoturia of the horse.—*La Clinica Vet., Milano, 1947.*

Parathion Poisoning

Dr. Norman Lewis of Canandaigua reports (*Vet. News*, Sept.-Oct., 1950) the case of a cow which died of pulmonary emphysema in spite of having been treated with atropine and pryibenzamine. The autopsy revealed marked interlobular and alveolar emphysema with no congestion, hemorrhage, or edema of the lungs. There were large cavities of air in the lung tissue, a most marked emphysema. This is thought to be the first report of parathion poisoning in cattle or in domestic animals. The chemical analysis of the lungs showed 11 parts per million of parathion (0,0-diethyl, 0,*p*-nitrophenyl thiophosphate).

Streptococcic Endocarditis

Streptococcic endocarditis has been reported in cattle of all ages and both sexes, but not in calves, according to the *Irish Veterinary Journal* (May, 1950). The frequency of occurrence is increasing, and the condition is important to practitioners because the symptoms can be confused with endocarditis and traumatic pericarditis — heart sounds, swelling in the intermaxillary space, jugular pulse, and sudden death.

Origin of the infection, course of the disease, and organ of primary focus have not been established. Massive, gray, cauliflower-like vegetative growths on the mitral cusps cause almost complete closure of the orifice. Both chambers may be affected.

Toad Venom (Bufanin) in Calf Scours

Calf scours, in the sense of the grave infections of the newborn calf, responds to the administration of the venom extracted from the skin, glands, and blood of toads (Bufo, spp.) and lizards. [The terms *bufanin, bufonin, bufagin, bufotalin* are but different names for the toad venoms (toxins) used therapeutically.] Sollmann ascribes digital-like and epinephrine-like action to the rare drug. It augments blood pressure and stimulates smooth muscles, notably of the intestines, by both central and peripheral action, precisely the condition needed to block massive admission of pathogenic flora into the blood of newborn calves, especially in the absence of colostrum. On the whole, however, meager attention is given to bufotherapeutics in American pharmacologic literature.

Gallier, practitioner of Cher, France (*Rec. méd. vét.*, June, 1950), not satisfied with the new sulfonamide-antibiotic-vitamin therapy, resorted to the addition of toad venom with gratifying results. To the other antagonistic drugs, a 10-cc. ampule (8 U. S.) of toad venom was given subcutaneously morning and night for three to five days. Badly stricken calves as old as 10 days are reported to have responded promptly.

Cattle Grub Control

Cattle were sprayed at intervals of two weeks with a number of chlorinated hydrocarbon insecticides, including DDT, DDD, methoxy-DDT, chlordan, toxaphene, and BHC. Monthly counts of larvae in the backs of the cattle six months later showed that there were as many grubs present in the sprayed animals as in the unsprayed controls.—*Abstr. in Rev. Applied Entomol., Aug., 1950, from J. Econom. Entomol., vol. 42.*

NUTRITION

Nutritional Aspects of Resistance

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ONE OF THE oldest medical concepts is that good nutrition is important for resistance to disease. Sociologists and others have long noted the apparent higher disease rate among lower income groups (malnourished). Conclusions drawn from these observations have not been easily substantiated. Many complex factors made this task a difficult one.

Nutritional standards, both for animal and man, have not been completely determined and some elements show considerable disparity. To add to the complexity of the problem, the mechanics of resistance and nutrition are not thoroughly understood. Many nutritionists have been lacking in microbiologic knowledge and many microbiologists have lacked sufficient dietary knowledge, which led them to be more or less indifferent to the rations of their laboratory animals.

The purpose of this review is to condense the literature and point out a few factors that should be considered in a study of the importance of nutrition on resistance to disease.

DIETARY EFFECT ON THE CELLULAR MECHANISM OF RESISTANCE

Protein and General Nutrition.—The effect of protein intake on resistance to disease appears to be considerable. Cannon *et al.*[12] stated, "It is to be expected that profound undernutrition and its concomitant depletion of the protein reserves should influence adversely the mechanism of natural resistance because a protracted period of protein deficiency leads eventually to a marked atrophy of liver, spleen, and bone marrow, and from these tissues most of the phagocytic cells originate. Inasmuch as protein is the basic material from which all tissues are ultimately constructed, the absence of protein stores necessary for proper construction of leucocytic reserves might also reduce the continued production of phagocytes."

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Recent work by Mills[87] indicates that:

1) Phagocytosis is the first line of defense against bacterial infection.

2) Granulocytes need to be "well-born."

3) In a large group of respiratory infections, burns, and wounds, our chief defense lies in the basic activity of phagocytes (unreinforced), by humoral mechanism which may become an important stimulant to phagocytosis only after two or three weeks' exposure.

4) Deficiencies of B group (except inositol or p-aminobenzoic acid and C) or of protein sufficient for body growth interferes with the marrow production of normal active phagocytes.

5) Phagocytosis is 4 to 5 times more active in some human beings in the summer than in the winter, which may explain greater susceptibility in winter to many diseases.

6) Restoration of an adequate diet after a faulty one does not improve the phagocytic activity until after a lag of two to three weeks which indicates that these cells are affected by the bone marrow nutrition during their early life.

Vitamin Deficiency.—Hassan, Ibrahim, and Khanna[35] showed that leucocytes responded, collectively and differentially, to the level of blood vitamin A content. An increase of vitamin A decreased the number of leucocytes with an increase in lymphocytes and monocytes. The neutrophils and eosinophils decreased. They concluded that a relationship exists between vitamin A and general defense of the body and a lack of vitamin A causes histologic changes of the epithelial cells (keratinization) and impairment of the dark adaptation and, finally, that a lowered local resistance is the result of vitamin A deficiency.

Cottingham and Mills[18] demonstrated that tropical, moist heat reduced resistance in laboratory animals but did not change the antibodies. It was noted, however, that a vitamin deficiency severe enough to retard growth retarded phagocytic activity, and a lack of vitamins A and D seemed to retard phagocytic activity.

Robertson[78] stated that vitamin C deficiency produced a most marked effect on resistance, and lack of vitamin A was effective but that a vitamin D deficiency seemed to mean little. She noted that the immune responses of deficient animals were not affected even when resistance was lost. This may indicate a phagocytic function. Chan-

dler[54] states that the prime factor of resistance to helminths is local, a property of the mucosa to inhibit worm nutrition.

DIETARY EFFECT ON HUMORAL MECHANISM OF RESISTANCE

Protein and General Nutrition.—Cannon[11] was able to demonstrate that antibody production is decreased in protein-depleted rabbits and rats—likely a result of inadequate supply of protein precursors of *gamma* globulin, the antibody protein.

Wissler *et al.*[10] noted that severely depleted rabbits had atrophy and simplification of the bone marrow with atrophy of the lymphatic elements, particularly the spleen.

Cannon,[11] using young rabbits made hypoproteinemic by low protein diets, found them to have a definitely lessened capacity to produce agglutinins when compared with the control animals. Adult rabbits showed the same effect.

Wissler *et al.*[10] have provided further evidence that high quality proteins, an enzymatic digest of casein, or a mixture of crystalline amino acids to the diets of rats previously depleted of protein, brings about a prompt increase in the capacity to produce antibodies; also that body weight, serum protein, and hemoglobin were increased. They concluded that the systems of protein synthesis seem to be the same for each species.

Auerswald and Bornschein,[3] in a comparative study of undernourishment in city and country children, found that 20 per cent of the town children had subnormal serum albumin while only 4 per cent of the country children were subnormal. This difference was considered to be due to the difference in the supply of milk (albumin) available to these two groups. These workers stressed the biologic change in the blood as showing the state and degree of undernourishment. Their animal experiments showed the bad effects of too little protein. These authors felt that the time of year (summer) of the human study made it improbable that lack of vitamins played a main part in the demonstrated difference.

Madden and Whipple[33] found that *gamma* globulin (antibody) orginates from amino acids and presented evidence that a protein deficiency reduced the ability of certain tissues to elaborate specific antibodies.

Trowell,[51] in Africa, noted that in "Kwashiorkor" (malignant malnutrition) the serum albumin is always grossly reduced, usually below 2 Gm./100 ml. Kwashiorkor has a malnutrition pattern—crazy pavement dermatosis, lack of growth, edema, lowered plasma albumin with gastrointestinal defects, and a fatty liver.

Waterlow,[54] in the British West Indies, stated that if Kwashiorkor is a protein deficiency, then the gut and liver, two high points in nutrition and metabolism, are very important. He pointed out that, with a daily intake of 60 to 70 Gm. of protein, the daily output of protein was as follows:

Pancreas	5 to 6 Gm. daily
Gastric juice	10 Gm. daily
Liver	15 Gm. daily of plasma protein.

He said that a dog which had fasted for three weeks lost 40 per cent of the body weight as a whole, whereas, the dog's pancreas alone lost 62 per cent of its former weight.

Vitamins.—Stucky and Rose[50] found that the blood sugar values were not changed significantly by lack of vitamin B but that chlorides tended to decrease. Dogs developed anhydremia in advanced vitamin B deficiency (related to body weight loss) and their consumption of water varied directly with intake of vitamin B. Most of the effects on the blood seemed to be due to starvation.

Whitehead and Barlow[52] noted an inanition of rats with rice disease on complete fasting and a diminution of red blood count, hemoglobin, and total blood volume.

Axelrod *et al.*[2] noted that hemagglutinin production in response to inoculation with human red blood cells was severely impaired by pantothenic acid and pyridoxine deficiency in rats.

Feller *et al.*[23] failed to disclose a significant effect of vitamins A and C upon phenomena involved in serologic tests upon antibacterial and antiviral material.

Kodicek and Traub[46] found no significant change in complement production in vitamin C deficient guinea pigs. The exact role of complement is not understood; therefore, conclusions should be guarded.

Gothlin[28] noted that fragility of capillaries occurred in persons who were more susceptible to disease and who were deficient in vitamin C.

Dalldorf[21] increased the strength of the capillaries of vitamin C deficient children by adequate dosage. Vitamin C is one of the factors which hold cells together in specialized tissues and organs, and its withdrawal results in disintegration. Blood vessels, bone marrow, bones, connective tissue, and nerves are involved.

Talliaferro and Sarles[49] found that rats with *Nocardia muris* infection repaired the damaged epithelium (villi) by mitosis in the crypts and inflammation in the lamina propria. They felt that immunity was humoral with a secondary cellular coöperation—the antibodies (precipitins, etc.) immobilizing, forming precipitates, stunting, and even killing the worms.

NUTRITION AND BACTERIAL INFECTION

Protein and General Nutrition.—Berry, Davis, and Spies,[5] using rats, concluded that resistance to bacterial infection may be depressed significantly by inadequate nutrition. The average agglutination titer for a mixed typhoid-paratyphoid vaccine was less than one fourth that of males on a good diet and one half or less for females on the basal versus the complete (good) diet. Careful checks

were made of the white blood count, differential count, phagocytic activity, and antibody measurement.

Schneider and Webster,[71] in a rigidly controlled study, demonstrated that mice receiving a "natural" ration of whole wheat and dried milk were more resistant to mouse typhoid than those receiving a so-called synthetic ration in which all components were defined. The protective factors seemed to be in the whole wheat, not protein or a water-soluble vitamin present in the wheat. The nature of the mechanism is not yet known.

Hitchings and Falco[28] demonstrated a "different" factor in whole wheat which was active in decreasing the resistance of mice to pneumococcal infection.

Gowen[24] reported that mice of strains genetically constituted so that they are particularly resistant to *Salmonella typhimurium* maintain higher leucocytic counts and a greater proportion of white pulp in the spleen than do mice of susceptible strains. This whole wheat factor may work on the reticulo-endothelial system or humoral mechanism.

Miller and Bauman[38] found that the feeding of increased amounts of casein contributed to the ill health of mice and that the increased store of protein metabolism caused a more rapid depletion in the tissue stores of pyridoxine (B_6). The interdependence of protein and vitamins is illustrated by the synthesis of niacin from tryptophan and vitamin deficiencies may be, to a considerable extent, related to the protein level in the diet. Deuel[22] says that although no important relationship of minerals to protein requirements has yet been demonstrated, this foodstuff probably will be shown to be important in the future. Wissler *et al.*[69] found that rabbits, depleted of protein, showed a much greater tendency to develop spontaneous infections.

Whipple[67] called attention to the greater susceptibility of plasma-depleted dogs to infections, with improvement after protein feeding.

Watson *et al.*[65] noted that mice showed greater susceptibility to natural contact infections on a dried skim milk-free diet.

Vitamins.—Thomson[59] noted that there was a shortage of protein, vitamins A, B complex, and C, and possibly of calcium, among children of the Fiji Islands. The serious aspect was that these deficiencies are of a permanent nature (mores, customs, etc.), resulting in increased incidence of serious infections associated with the lowered resistance to disease.

Clausen[17] found that severe infections among 317 infants were twice as frequent in those whose previous diets lacked vitamin A as in those to whose diet it was added in form of cod liver oil from 3 months of age, and also in the form of vegetables with carotene from 6 months of age. Rose and Rose[53] showed that dogs receiving 13 to 33 per cent of normal vitamin B requirements became definitely less resistant to infections with *Staphylococcus aureus*. Lamb[40] found that rats were more susceptible to rat leprosy when fed vitamin B deficient diets.

Wooley and Sebrell[66] noted that mice were definitely more susceptible to pneumococcus I (by nasal spray) when they had been kept for two to three weeks on diets low in thiamine.

Rose[52] noted that dogs without vitamin B are susceptible to *Bacillus aerogenes capsulatus* and that a liberal supply of vitamin B was essential for protection maintenance. Findlay[27] discovered that pigeons with polyneuritis lost their natural resistance to anthrax. He suggested that this was due to the lowering of the body temperature or starvation (lack of vitamin B). Rose[53] saw that spontaneous or induced infections with *Clostridium welchii* occurred in dogs partially deficient in vitamin B.

Pinkerton and Bessey[50] demonstrated that a riboflavin deficiency was very effective in reducing the resistance of rats to typhus. They found that the Kupffer cells were heavily infected and suggested that since Rickettsia are intracellular and greatly affected by host cell nutrition (cellular oxidation was reduced by riboflavin deficiency), a transient depletion might have value as a therapeutic measure. Riddle *et al.*[51] noted that pellagrous lesions around the mouth with *Staph. aureus* and *Streptococcus hemolyticus* were cleared of organisms after riboflavin treatment. The same was true of Vincent's organisms in the mouth.

Kligler *et al.*[34] concluded that a biotin deficiency diminishes resistance to Salmonella infection in rats and in mice.

In the laboratory, infection is most frequently seen in vitamin C deficient animals. Scurvy and infectious diseases seem to go together. In 1895, Theobald Smith, studying swine erysipelas in guinea pigs, observed that those on a ration deficient in grass, clover, and vegetables, seemed to die early. He surmised that the restricted diet caused the death of guinea pigs which otherwise might have survived the inoculations.

Birkhaug[5] noted that guinea pigs depleted of vitamin C had more collagenous scars and more dissemination of tubercular infection. Earlier work on human tuberculosis was done by Heise *et al.*[26] with similar results.

Eddy and Dalldorf[24] noted that guinea pigs on inadequate diets developed more extensive lesions and were more susceptible to tuberculin shocking than animals on an adequate ration when both groups were injected with sputum and urine concentrates.

Jackson and Moody,[40] Wamascher,[63] and Bieling[4] presented much evidence to indicate that guinea pigs on a vitamin C deficient ration were more susceptible to Streptococcus, Pneumococcus, Staphylococcus, and tubercular infections.

Dalldorf[23] was able to increase the resistance of children to infections with vitamin C. He found that persons with scurvy were notably susceptible to infection which has been further shown by guinea pig experiments.

Zinsser *et al.*[70] found that scurvy in guinea pigs

increased their susceptibility to typhus, with the Rickettsia more widely distributed and more numerous in the deficient animals. (Rats were affected the same but less.)

Robertson[20] made extensive studies which indicated that the rachitic rat was not unusually susceptible to paratyphoid infection. The effect of vitamin D on resistance appears to be questionable.

Miscellaneous.—Minot[21] states that infections, however mild, are a common cause of iron loss, and that an individual, taking just enough iron to maintain equilibrium, may be precipitated into the zone of partial deficiency by the advent of infection.

NUTRITION AND VIRUS INFECTIONS

General Nutrition.—Tannenbaum[22] found that diet-deficient chickens and mice were *less susceptible* to sarcoma virus. A similar effect in infantile paralysis of rabbits was seen by Rivers.[23] The malnourished animals showed fewer and smaller lesions than the well-fed animals. The paradox of increased resistance to virus infections in the presence of deficient rations has been tentatively explained on the basis of cellular nutrition. Viruses are apparently exclusively parasitic on host cells and their nutrition. Infective agents differ widely in nature and mode of action; therefore, the mechanism of resistance may be expected to vary.

It is thought that when the body cells are inadequately nourished, the virus is kept from spreading. This results in the apparent increased resistance to virus infection as shown by the malnourished.

Vitamins.—Foster *et al.*[24] noted that many mice on a 40 per cent of normal thiamine intake actually appeared to escape the paralytic effect of poliomyelitis. These results indicated that this deficiency state delayed action of the virus rather than prevented it.

Rasmussen *et al.*[25] reported a similar *increased* resistance to poliomyelitis in riboflavin-*deficient* mice.

NUTRITION AND PARASITIC INFECTIONS

Protein and General Nutrition.—A review of literature shows few Protozoa in the intestines of carnivorous animals, while the herbivorous animals usually have heavy infections. It is thought that the higher protein diet, with the associated increase in proteolytic anaërobes and in fermentative anaërobes, decreases the number of intestinal Protozoa.

Waxler[26] states that rats on a high *animal* protein ration, were relatively free of *Trichomonas muris*. It was noted that an *animal* protein ration was better than a *vegetable* protein ration (possibly because of a wider range of amino acids in the animal protein). Waxler stated that Hegner found a high protein diet rendered the intestinal content *less favorable* to parasites but that a high carbohydrate diet favored the growth of parasites. A high protein diet is recommended as an aid to treatment of *Trichomonas hominis* (Larsh[27]).

Seeler and Ott[28] showed that chicks which were fed a variety of protein content rations had a reduced serum protein at the lower levels. These hypoproteinemic chicks, when infected with avian malaria, suffered severely, while the chicks at the highest protein intake were able to overcome the malaria parasites quickly. It was also evident that a protein deficiency which did not lower the serum protein noticeably, still had a marked effect on the course of the disease.

Ghosh[29] found that the serum protein, especially albumin, was reduced in malaria.

Vitamins Plus Other Factors.—Chandler[30] noted that tapeworms did not need vitamins A, B_1 D, or E, but did need vitamin G for growth. He concluded that the toxicity of *Hymenolepis diminuta* was due, in part, to an induced vitamin B deficiency in the host.

Katsampes *et al.*[31] have reported observations indicating that the absorption of vitamin A is impaired by the presence of *Giardia lamblia* in the bowel.

Chesney and McCord[32] observed that vitamin A absorption was less than normal in 15 cases studied and they concluded that *G. lamblia* had a harmful effect on man.

McCoy[33] noted that resistance of rats to Trichinella was markedly lowered by a vitamin A deficiency.

Tissues of worms contain the same proportion of vitamins as those of higher animals (Chance and Dirnhuber[34]). Pyridoxine is an exception, the worm having more in proportion to the corresponding host tissue. This may be the cause of the high rate of worm egg production (protein synthesis).

Caldwell and Gyorgy[9] reported that biotin-deficient rats are abnormally susceptible to infection with *Trypanosoma lewisi*.

A vitamin E free diet slightly increased the resistance of rats to Trichinella (Zaiman[35]).

Rogers and Lazarus,[36] using radioactive tracers, noted the importance of carbohydrate metabolism in adult nematodes suggested by the predominance of glycogen among reserve substances of the worm (5.7% of an Ascaris adult).

Fenwick[37] found Ascaris larvae could maintain themselves in 0.1 per cent of dextrose if sodium chloride, 0.832 per cent in a neutral solution, was present.

Reid and Ackert[38] noted that a reduction in carbohydrate intake hindered the production of tapeworm proglottids in chickens.

Chandler[39] found tapeworms were totally independent of protein in the diet of the host, but they were dependent on carbohydrates. Adult worms absorbed nutrients directly from host tissue.

Cruz and Pimenta De Mells[40] noted the great importance of adequate nutrition in hookworm anemia-deficiency disease. They advocated iron salts in the diet as being more practical than the wearing of shoes.

Rhoads *et al.*[6] observed that hookworm anemia was due mainly to insufficient blood production, a result of iron deficiency and other hematopoietic substances in the body which is postulated to be produced by multiple factors: defective diet, indirectly by gastrointestinal changes, or by simple blood loss (worm). Addition of iron only to the diet, produced a noted change.

Vegheli[7] noted that an increased amount of fat and lipase was found in the stools of children having *G. lamblia* and concluded that these parasites impaired the absorption of fat from the intestines. His work showed that the parasites "cover" the lumen and render it impermeable (rabbits had as many as 1,000,000/sq. cm. of lumen).

(*To be continued*)

Iron deficiency in animals is due more often to loss of iron through excretions than to lack of intake. Profuse sweating and the transfer of iron to the fetus are among the most common causes. Iron-deficient feed is seldom the primary factor.

It is somewhat difficult to discuss calcium deficiency apart from vitamin D deficiency. The two are so inter-related that, to some extent, they may be considered to constitute a single disease.—*Council of Foods and Nutrition, American Medical Association.*

Deficiency Disease a Herd Problem.—If a true deficiency desease occurs in 1 member of a group of livestock, it logically follows that a number of the other animals, perhaps all of them, have been exposed to the same error in feed composition—not just the animal that is visibly sick.—*Prof. B. Carlstrom, Royal Swedish Veterinary College, Stockholm.*

Syndrome of Vitamin B Deficiency.—A paralytic disease of swine that responded to parenteral injections of thiamine hydrochloride is described by Nielson and Christensen (*Nord. Vet. med.*, abstr. *Rec. Méd. Vét.*, Aug., 1949:379). A brief prodrome of impaired appetite and transient diarrhea was followed by an ascending paralysis of the limbs and skeletal muscles of respiration. The pigs were 10 weeks old and, since weaning, had been sustained on cooked potatoes, sugar beets, and some roughage. They were veritable cases of beriberi, the report declares. (*See* "Scandinavian Literature," Dec., 1950, JOURNAL, p. 479.)

Vitamin A

Vitamin A deficiencies are more likely to occur in farm animals during the winter and spring months than at any other time of the year. Animals on pasture are usually supplied with ample carotene unless the grass has become dry and lost the green color. One of the functions of vitamin A is to maintain the normal epithelium of the respiratory, alimentary, reproductive, and genito-urinary tracts, and also the eye. When vitamin A is not present in sufficient quantity in the rations, the normal epithelium changes to a less-specialized, keratinized epithelium. In this process, microorganisms frequently invade the animal body, thus producing an infectious disease.

Vitamin A deficiency may cause incoördination, staggering gait, and spasms in cattle, sheep, and swine. The eye lesions vary in animals, and may be manifested in cows by lacrimation; closed eyelids with a thick, creamy exudate in chickens; and blindness in calves. Anasarca is associated with vitamin A deficiency in cattle. Reproductive disturbances are often observed in both males and females. In many cases, the young are born prematurely, and are dead or weak. The vitamin A requirements for reproduction are greater than for maintenance.

It is known that all animals require a dietary source of vitamin A. Growth is impaired in vitamin A deficiency. Milk supplies lambs and calves with sufficient vitamin A if their mothers have been fed an adequate amount. Bright green, leafy, legume hay will supply cattle and sheep with adequate amounts. Five to 10 per cent of green alfalfa hay will provide pigs with sufficient vitamin A. The fish oils are the richest sources of vitamin A. By including 1 to 2 per cent of fish oils in the rations of chickens, the vitamin A requirements are met and also supply an adequate amount of vitamin D.—*M. J. Swenson, D.V.M., Department of Physiology, School of Veterinary Medicine, Kansas State College, Manhattan.*

EDITORIAL

Who Knows the Cost of Animal Diseases?

For more years than one likes to admit, the veterinary medical profession, our veterinary educational and research institutions, livestock disease control agencies, and the livestock industry itself have operated without a clear picture of the total morbidity and mortality losses from animal disease. We have had a general idea about these things but, at best, it has been sketchily drawn, only a few details are distinct, and many are missing altogether.

The reasons are obvious. Virtually no authenticated data exist as to what most animal diseases actually cost the livestock owner when analyzed in terms of initial cost of the diseased or dead animals; the expenditures of feed, labor, time, and materials in raising the animals affected; and the failure to realize full values from them, either through their sale or as breeding stock on the farm.

The fully detailed picture of animal disease morbidity and mortality is too vast and too complicated a subject to be depicted and, practically speaking, minute detail is unnecessary. Yet, if we are to carry on intelligent and effective disease control work, it is high time that we stop talking and act to clear up the obscure parts. Not to do this is unscientific and unrealistic.

Previous Approaches to the Problem by the AVMA

As long ago as 1938, Dr. H. D. Bergman, then president of the AVMA, appointed the first Special Committee on Nomenclature and Vital Statistics. In its first year, the Committee analyzed its assignment and decided that the first step would be preparation of a standard nomenclature system to permit uniform designations for the diseases and conditions on which statistical data would eventually be obtained. This phase of the work has entailed a great amount of study in compiling the many details of classification and nomenclature that must be included in an authoritative treatise of its kind. The work suffered some interruption during the war years but has now progressed to a point where early completion can be anticipated.

In 1943, President C. W. Bower appointed a separate Special Committee on Vital Statistics, it having been realized that the task given the original committee involved two quite different jobs. In its first report to the Association, made in 1944, this Committee set forth the lack of, and need for, accurate information on animal disease incidence and losses in the following emphatic terms:

> During the past half century or more, both federal and state governments have spent millions of dollars on animal disease control. Yet, with the possible exception of bovine tuberculosis and brucellosis, we have little or no authentic information on the nation-wide incidence of animal contagions, their total morbidity and mortality, geographical distribution, and many other vitally important facts. We have directed funds and vast expenditures of professional energy in disease control without knowing the full extent or the total ravages of such diseases.
>
> This in no way belittles the fact that a great mass of valuable information has been accumulated, both by the various states and by the federal government on many diseases of both animals and fowl. But, the fact remains that we do not have, in this most advanced of all livestock nations, authentic, tabulated, and statistically correct data on the nation-wide incidence of animal contagions, to say nothing of the less spectacular, though often more costly, infectious and noninfectious diseases.

The report (*see* the JOURNAL, Nov., 1944, pp. 331-334) gave results of a questionnaire survey of state livestock sanitary officials on the status of disease reporting. In its summary, the Committee made the following important recommendation:

> *In that the development and establishment of a working organization is, in all probability, beyond the scope of a volunteer committee or, in fact, beyond the facilities of the present*

AVMA office and personnel and, further, in that the entire problem is one unquestionably related to sound agricultural economics, it appears advisable that the AVMA should formally petition the Secretary of Agriculture to establish within the federal Bureau of Animal Industry, a "Division of Vital Statistics on Animal and Poultry Disease."

THE NATIONAL RESEARCH COUNCIL ENTERS THE PICTURE

Early in World War II, the National Research Council, the working organization of the National Academy of Sciences, became concerned with agricultural problems in relation to the general welfare of the country and set up an Agricultural Board to study them. One of the first problems considered by the Board was the economic loss to the country through diseases of domestic livestock and poultry and, naturally, the veterinary medical aspects of that problem. As a result, the Agricultural Board decided to sponsor a Committee on Veterinary Services for Farm Animals.

Appointed early in 1945, it comprised six veterinarians, one physician, two animal husbandrymen, and two research chemists. The members agreed upon the broad objective of undertaking activities "that would tend to decrease the economic loss to the country through the mortality and morbidity of livestock," as pointed out by the committee chairman, Dr. R. C. Newton, in addressing the 1946 AVMA annual convention in Boston (*see* JOURNAL, October, 1946, pp. 268-272.) Dr. Newton pointed out the lack of reliable data on animal disease losses as follows:

> The first, and perhaps the most important, project is to determine the extent and cause of losses through mortality and morbidity of livestock. We have searched the records in the literature, we have discussed the problem in Washington and at the capitols and state colleges of many of our midwestern states. We have considered the condemnation records at federally inspected meat packing plants; we have considered the records of the rendering companies, of the farm management departments in the Extension Services of the various states, and various other sources, but we have not found records which could be used in making reliable computations on the total losses from either death or sickness of livestock.

As a result of further conferences and discussions, particularly with various bureaus of the USDA in Washington, a pilot study was set up in 1945 at the Statistical Laboratory at Ames, Iowa, jointly sponsored by the Bureau of Animal Industry, the Bureau of Agricultural Economics, Swift and Company, and the Statistical Laboratory of the Iowa State Experiment Station. The objective was to study methods of surveying losses due to sickness and death in livestock and poultry. A preliminary report on the results of this study was given at the fifty-first annual meeting of the United States Livestock Sanitary Association in 1947 (*see* "Proceedings," U.S.L.S.A., 1947, pp. 218-225). Later, by projecting the results of the pilot study, it was estimated that the losses due to deaths alone among farm animals in Iowa in one year totaled $26 million.*

LIVESTOCK SANITARY OFFICIALS BECOME INTERESTED

In 1945, the Committee on Miscellaneous Transmissible Diseases of the U.S.L.S.A. transferred its attention and devoted most of its annual report to the need for establishing a reporting system on animal diseases. The name of the committee was changed to Committee on Morbidity and Mortality Statistics and, in its successive reports since 1945, it has developed information to support the establishment of an agency whose functions would include collection of vital statistics on diseases of livestock and poultry. Among other things, this Committee has stressed the following needs:

1) Reliable morbidity and mortality data.
2) A standard nomenclature of animal diseases.
3) Standard methods of laboratory diagnosis.
4) A Division of Vital Statistics in the BAI.
5) Diagnostic and statistical laboratories.
6) Epizoötiology and vital statistics course at veterinary colleges.
7) Widespread support to be organized for the inclusion in the budget of the U. S. BAI for the early establishment and operation of a division of vital statistics.

A poll conducted by this Committee showed a majority agreement for locating the collecting agency in the office of the state livestock disease-control official

*In November, 1950, the Committee on Animal Health of the National Research Council adopted a resolution urging responsible leaders of the federal government to delay no longer in establishing a division in the Bureau of Animal Industry to compile animal disease statistics.

(86%), for reporting of infectious disease outbreaks to be required by law (85%), and for wide distribution, without charge, of periodic reports on the data collected to veterinarians, public health officials, and other persons on request (90-100%). There was almost universal agreement that a program of vital statistics collection should be instituted at once, and that all agencies should actively support a campaign to make budgetary provision for early establishment of a suitable division in the U. S. BAI.

THE ROLE OF PRACTICING VETERINARIANS

In its 1944 report, the AVMA Special Committee on Vital Statistics gave results of a questionnaire survey designed to determine the status of animal disease reports required by law or by regulation. In 33 states, reporting of animal contagions is mandatory either by law (29) or by departmental regulation (4), or both (3). Four states have no laws, regulations, or penalties relative to reporting animal contagions. Twenty states have penalties for failure to report, ranging from a minimum fine of $5 to $500, or one year in jail, or both. In one state, the penalty is revocation of license to practice. In most states, penalties are enforced only for grave infractions of the law.

Throughout all the discussions on this subject, it has been repeatedly emphasized that the practicing veterinarian is the key figure in any successful system of animal disease reporting. He has been criticized for noncoöperation in the few abortive attempts that have been made in some states to gather data on reportable diseases. The livestock sanitary official often is equally at fault, since he has not consistently tried to enforce the laws and regulations and, with few exceptions, has not educated veterinarians and livestock owners to the importance of disease reporting.

No farmer wants ownership of unhealthy animals to become public information and few want to face the risk of quarantine. The practicing veterinarian courts disfavor of clients by reporting infected animals; therefore, he does so only in the more serious diseases such as anthrax, tuberculosis, brucellosis, etc. Consequently, if any long-range program of disease reporting is to be developed, especially of the less dangerous infectious and noninfectious diseases, it is obvious that the personal importance of the program must be thoroughly sold to livestock owners and to veterinarians.

CLEAR DEFINITION OF GOAL NEEDED

If the patent difficulties in this whole problem are to be reasonably well overcome, the program must not be attempted until a sizeable majority of livestock owners are convinced that comprehensive data on losses from animal disease are important to their individual future success and progress. All veterinarians and students of veterinary medicine must likewise be indoctrinated as a matter of professional and official responsibility.

The program adopted can not be aimed at absolute statistical accuracy; such perfection is not attainable at a reasonable cost and, moreover, is not necessary. However, if our vaunted claims of leadership in scientific animal husbandry and veterinary science are to stand up under the scrutiny of related fields of science, we must soon develop some feasible system to inform us with reasonable accuracy on what animal diseases of all kinds are costing us in dollars and in public health. Failure to develop an honest-to-goodness appraisal of animal disease costs and human health dangers is neither intelligent nor realistic and can be explained only by a prodigal and careless disregard of the facts of life or an unwillingness to face them.

The large sums appropriated, publicly and privately, for research, control, and eradication of animal diseases indicate that reasonably good justification was given. Now, the need to pin-point targets for research and control programs in animal disease is becoming more evident. This is especially true when the state and national legislatures face demands for the really urgent needs of military preparedness and civil defense and must analyze and balance other demands on the basis of proved need and importance.

TWO SUGGESTED ACTION APPROACHES

Although a great deal of study and discussion of the animal disease morbidity and mortality problem, statistics-wise, has already taken place, it seems that up to now there has been no real pooling or collection of existing information, with the exception of the work done by the Committee on Veterinary Services for Farm Animals of

the National Research Council. Even this is not complete. Moreover, to our knowledge, there has been no all-inclusive gathering together of persons whose training, experience, and talents might be concentrated on the data that are available and on the various aspects of the problem that must be analyzed before any concrete and well-developed plan can be presented to the Congress for financial support.

Two suggestions are offered:

(1) That there be a conference of persons representative of the fields and agencies who could contribute worth-while material and ideas to the formulation of a vital statistics system on animal disease. These would include, but not be limited to, the AVMA Special Committee on Nomenclature; the N.R.C. Committee on Veterinary Services for Farm Animals; the Committee on Morbidity and Mortality Statistics of the U.S.L.S.A.; the Bureau of Animal Industry, Bureau of Agricultural Economics and other appropriate bureaus of the U.S. Department of Agriculture; the Extension Service; the Statistical Laboratory at the Iowa State College Experiment Station; the AVMA Special Committee on Veterinary Services; the appropriate divisions of the U.S. Public Health Service; the appropriate sections or committees of the American Medical Association and the A.P.H.A.; the veterinary deans; the Food and Agricultural Organization and the International Office of Epizoötics, etc.

2) That a fellowship be provided at once through the AVMA Research Council, with any funds that may be made available, for a specific project to collect and to analyze all available information on animal disease statistics, including methods.

It is our firm belief that when a workable system of animal disease reporting is devised, either on an all-inclusive basis or on a statistically-approved sample basis, practicing veterinarians and all other veterinarians will coöperate, provided that they understand its purposes, reasons, and potential values.

Rats consume the output of 265,000 United States farmers. The food destroyed by them is estimated to be worth $200,000,000 annually.

Jerry Raymond Beach
1888-1951

Dr. Jerry Raymond Beach (COR '13), 62, professor of veterinary science, University of California, died in Davis on Jan. 4, 1951. He was probably the first well-qualified scientist to devote full time to research on diseases of poultry. In 1914, soon after he joined the staff of the Division of Veterinary Science at California, his specialized work began to yield results of scientific merit and great practical value to the poultry industry of the Pacific Coast. His earliest work was done on the roup-complex of chickens, and he demonstrated that one form of roup was caused by a nutritional deficiency, now known as A avitaminosis, which could be prevented by the addition of greens to the ration. Another major activity was his study of avian coccidiosis which led to the use of milk products as a means of controlling this disease. These two discoveries and their immediate application in the field brought about a speedy and remarkable improvement in poultry health and efficiency in California. Some other achievements include inauguration of nicotine treatment for roundworms, improvements in vaccination for fowlpox, methods for the differential diagnosis of several virus diseases of chickens.

Dr. J. R. Beach

Dr. Beach pioneered in the discovery of

Newcastle disease which he called avian pneumoencephalitis; in fact, his major effort in the past decade was devoted toward the study of the virus, diagnosis of the disease, and methods for its prevention and control. His frequent and up-to-date articles and bulletins have been a definite contribution to the welfare of the poultry industry. His voluminous bulletin on diseases of poultry was kept up to date by numerous revisions over a period of thirty years, and the demand for copies by poultrymen throughout the world was heavy. During his long years of service, he was vitally interested in training poultry pathologists, and a long list of men were influenced by his teachings, which has led to a better understanding of poultry disease problems.

Born in West Danby, N. Y., Dec. 21, 1888, he graduated from Phillips Academy, Andover, Mass., in 1910 and received his degree in veterinary medicine from Cornell in 1913, where he served on the staff as assistant in veterinary diagnosis in 1913-1914. Since then, he has been with the University of California.

Many honors have been conferred upon him. He was guest worker at the Rockefeller Institute, 1929-1931; veterinarian to the Ministry of Agriculture of the United Nations Relief and Rehabilitation Administration in China, 1946; delegate to the World's Poultry Congress at The Hague (1921), Leipzig (1936), Cleveland, Ohio (1939), and Copenhagen (1948); and to the International Veterinary Congress in London (1949). He served as vice-president of the World Poultry Science Association in 1922.

Dr. Beach was a member of the American Veterinary Medical Association, Poultry Science Association, U. S. Livestock Sanitation Association, California Veterinary Medical Association, and the World's Poultry Association, and was an associate in the Society of Bacteriology. He had served on various committees of the AVMA.

Surviving are his widow, Elzaida; two daughters, Mrs. George E. Smith, of Portland, Ore., and Ruth, of San Francisco; and a son, George, of College Station, Texas. His mother, Mrs. Alice Beach, resides in Oakland.

By unanimous decision Dr. Beach's coworkers in the School of Veterinary Medicine elected to establish a memorial to him in the form of a library encompassing poultry diseases and related subjects.

Practicing Veterinarians in Public Health

The veterinarians of Illinois have a great stake in public health,—not only in the professional and financial benefits derived from the veterinary public health program but in the recognition and consideration given them by the Illinois Department of Public Health when developing future programs in Illinois, says Dr. A. E. Dickerson (*Illinois Health Messenger*, Oct. 1, 1950). R. R. Cross, M. D., has recognized and publicly commended the veterinarians for their coöperation with public health officers and physicians in investigating and reporting animal diseases transmissible from animal to man. He suggests that "The veterinarian ideally should be an important part of the public health team working on those problems which are common to man and animals. The veterinarian should share in the initial planning on public health programs aimed at the control of human diseases which also have an animal host."

Past and Present

"The past history of this organization has been reviewed many times and is now a matter of record, a splendid record, one of distinguished achievements and accomplishments, proving that in our profession there is and has been great and outstanding leadership. It is up to us, the present members, to accept the constant challenge; to retain, sustain, and maintain this society as a living monument to that leadership and to those time-tested ideals we all know so well." (The foregoing, taken from the address of Dr. Lyle C. Compton, president of the New York State Veterinary Medical Association, in *Veterinary News* (Sept.-Oct., 1950), could well apply verbatim to the American Veterinary Medical Association or to any of its constituent associations—ED.)

Insects are the greatest enemies of agriculture, causing annual damages running into billions of dollars.

CURRENT LITERATURE

ABSTRACTS

Newcastle Disease in Hawaii

Embargoes and isolation of recognized cases did not prevent the spread of Newcastle disease (avian pneumoencephalitis) in Hawaii, although it imports most of its commercial poultry stock as baby chicks. The authors conclude, therefore, that under their conditions poultry owners are justified in using formolized virus on laying hens in the initial stages of the vaccination program. If preferred, killed virus vaccination of the layers may be followed in two to three weeks by live virus vaccination of birds from 5 weeks to 5 months of age.—[*H. E. Adler; E. H. Willers; J. Campbell: Newcastle Disease (Avian Pneumoencephalitis) in Hawaii. Am. J. Vet. Res., 12, (Jan., 1951): 44-47.*]

Examination of the Stomach Contents of Horses

According to the author, the examination of the stomach contents is a method widely used in Russia for the diagnosis of equine gastric disorders. He recommends the following procedure. The horse was starved for twelve hours and allowed no water for the last six hours. A stomach tube with a side opening was used. Two methods were recommended for determining the length of tube necessary to reach the stomach: 30 cm. was added to the height at the withers, or the distance from the nostril to the upper third of the sixteenth intercostal space was measured, taking account of the angles in the pharynx and thoracic inlet. It was recommended that at least two samples be taken—one from the empty stomach and another forty-five minutes after a test meal. For fractional determinations, four samples were sufficient—one from the empty stomach and the others forty-five minutes, one and a half hours, and two and a half hours after the test meal. One pound of crushed oats in 2½ qt. of water was fed as the test meal.

The sediment from the stomach contents of the fasting animal was examined microscopically. In purely secretory disturbances, the number of epithelial cells was not over five per field. Leucocytes were few. In catarrhal gastritis, the number of epithelial cells increased to 20 to 50 per field. The duration of the inflammation was indicated by the degree of dengeneration of the cells. The number of leucocytes was also increased in gastritis. Erythrocytes were seen in deep inflammation and ulceration.

The normal values for the acidity of the contents of the stomach were determined. (Although the unit of acidity is not defined in the article, it is probable that the values are expressed in degrees of acidity, or the number of cubic centimeters of N/10 NaOH required to neutralize 100 cc. of filtrate.) In the fasting condition, the free HCl was 0 to 4, the total acidity was 6 to 12, and the combined HCl was 5 to 10. One hour and a half after the test meal, at the height of the secretory reaction, the free HCl was 5 to 10, or occasionally absent; the total acidity was 18 to 30, and the combined HCl was 14 to 20.—[*N. R. Semushkin: On the Standardization of the Method of Examining the Stomach Contents of Horses. Veterinariya 27, (July, 1950): 46-50.*]—R. E. H.

Canine Distemper Virus

The Ministry of Agriculture of the U.S.S.R. has approved a new polyvalent distemper vaccine prepared from virus attenuated by chicken embryo culture. The virus was adapted to embryos by diluting it 1 : 10 and by repeated cross inoculations between pups and chicken embryos. The vaccine was tested on 600 dogs and foxes and found effective. Strains of distemper virus isolated from different localities were found to be immunologically distinct when tested by cross immunization and by the hemagglutination-inhibition reaction.—[*S. Yakolev: In the Ministry of Agriculture of the U.S.S.R. Veterinariya, 27 (July, 1950): 59.*]—R. E. H.

Aortic Arches in Equine Embryos

The existence of the fifth aortic arches in embryonic mammals has been questioned on the grounds that the irregular blood vessels between the fourth and pulmonary arches are of only secondary formation and can not, with propriety, be designated as true aortic arches.

The author reports a small blood vessel arising from the sixth aortic arch on the right side, which might be interpreted as a rudimentary fifth aortic arch. This agrees with reports on human and rat embryos. He also reports a small outpocketing of the fourth pharyngeal pouch, which reaches the area between the sixth and fifth aortic arches, and which might be regarded as a fifth pharyngeal pouch.—[*A. Vitums: The Development of the Aortic Arches in the Horse. Am. J. Vet. Res., 12, (Jan., 1951): 26-30.*]

Pathology of Foot Rot

The authors collected 116 naturally diseased bovine feet (61% were hind feet), sawed them into frontal serial sections, and classified them into eight groups: dermatitis, necrosis of interdigital tissue, arthritis of coffin joint, osteitis, laminitis, inflammation of connective tissue, arthritis of pastern and fetlock joints, and miscellaneous.

In addition, 8 calves were injected in the left common digital artery with a living culture of *Actinomyces necrophorus*. In no case did the experimental infection resemble the dermatitis, necrosis of interdigital tissues, or arthritis of the coffin joint as seen in natural cases of lameness.

On the basis of this study, the authors conclude that necrobacillosis of the bovine foot (foot rot) is a necrotizing infection of the tissues immediately proximal to the coronary band or of the interdigital tissues, often complicated by arthritis of the coffin joint, and caused, in part, by *A. necrophorus* penetrating from the surface.—*Jean C. Flint and Rue Jensen: Pathology of Necrobacillosis of the Bovine Foot. Am. J. Vet. Res., 12, (Jan., 1951): 5-13.*]

Infectious Canine Hepatitis

The author performed 482 autopsies on dogs, among which the virus diseases are represented by 53 cases of distemper, 13 cases of encephalitis, and 18 cases of infectious canine hepatitis (ICH). Pyrexia and leucopenia were observed to coexist in experimentally produced cases. No evidence could be demonstrated of a cataphylactic effect of tetrachoroethylene in experimental cases.—[*D. L. T. Smith: Observations on Infectious Canine Hepatitis. Am. J. Vet. Res., 12, (Jan., 1951): 38-43.*]

Hyaluronidase and Bovine Mastitis

No relationship was established between the production of hyaluronidase *in vitro* by streptococci responsible for mastitis and the severity of the inflammation of the quarter of the udder from which they were isolated, or the percentage of quarters freed from infection by treatment with penicillin, sulfamethazine, and diamino diphenyl sulfone.—[*T. A. Gochnauer and J. B. Wilson: Hyaluronidase Production in Vitro by Streptococci Isolated from Bovine Mastitis Cases. Am. J. Vet. Res., 12, (Jan., 1951): 20-22.*]

BOOKS AND REPORTS

Los Angeles County Annual Report

The twenty-sixth annual report of the Los Angeles County Livestock Department presents its usual excellent survey of the work of the members of this department. Marking the concluding year of Dr. L. M. Hurt's régime as director, it reviews the activities of the preceding twenty-five years.

It is recorded that egg production has increased 50 per cent in this time and that marketable fryers are now produced in ten weeks compared to thirteen or fourteen weeks only a few years ago. Rabbit fryers are ready for the market in eight weeks. Cattle, hogs, and sheep are prepared for market in shorter periods and on less feed per hundred pounds of gain. Milk production has been increased to higher levels per animal.

Veterinary science has contributed materially to these gains by preventing and controlling infective and contagious diseases of livestock.

The details of the report will be interesting to all who are engaged in similar activities elsewhere. —[*The Twenty-Sixth Annual Report, Livestock Department, Los Angeles County, California. L. M. Hurt, D.V.M., County Livestock Inspector. Mimeo. 58 pp., 1949-1950.*]

Bacterial Polysaccharides

As indicated in the title, this is a compilation of data on the polysaccharides of the various bacteria, and particularly their chemical and immunologic aspects. The data is concisely presented, and particular reference is made to the use of these carbohydrates as diagnostic reagents.

The book is divided into chapters, each of which discusses the polysaccharides of one species of organisms. This discussion is usually in the nature of a detailed account of the methods of isolating the polysaccharides, then a listing of the chemical, physical, and immunologic characteristics of these substances, and a concluding consideration of the use of such polysaccharides as diagnostic aids.

This book will serve to give a better understanding of infection and immunity to students in these courses, and particularly to instructors in these courses. It is doubtful, however, if the average practitioner will find the time to study the items as they are presented. However, the research worker in infectious diseases, and immunity to them, will find much which will help him to interpret his findings and explain the results which he is able to observe.—[*Bacterial Polysaccharides, Their Chemical and Immunological Aspects. By Martin Burger. Cloth. 273 pages. 48 tables. Charles C. Thomas, 301-27 East Lawrence Avenue, Springfield, Ill. 1950. Price $6.00.*]

A Handbook on Dogs

A compact little booklet which tells many of the things which dog owners will want to know concerning the selection of a dog, facts regarding the various breeds as they are usually classified, and the general care of dogs. It is not primarily a book designed to care for sick animals, in fact, the chapter on care of sick dogs is very brief and it is exemplified by two statements: "There can be no better advice on the subject of worming your house pet than to see your veterinarian. There is a different type of medicine for each type

of worm and the dosage must be given in accordance with the age and weight of the dog. The wrong medicine at the wrong time in the wrong dog can wind up as no dog at all." And "The best advice that can be given the home pet owner, regardless of whether the pet is a dog or another animal, is do not try to be your own veterinarian." —[*The care and Handling of Dogs. By Jack Baird. Cloth. 243 pages, 4¼ in. by 6½ in. Illustrated. Permabooks, 14 W. 49th St., New York, N.Y. 1950. Price $0.35.*]

Cats and People

Well known for their mystery stories ("Mr. and Mrs. North"), Frances and Richard Lockridge in their book, "Cats and People," lift the veil of mystery that many people associate with cats. Especially enlightening are the pages of the black history of the cat—black because of the torture which resulted, in medieval times, in near extermination by the ignorant and cruel; and enlightening because these pages explain that today's prejudices are rooted in that medieval inquisition.

Against the historical background of the cat, which goes back to Egypt where the cat was regarded as a god, the Lockridge's own cats are depicted with amazing understanding and keen perception. "Martini" is only one of several "personality pusses" that leap, purr, cavort, or grace their way into one's heart. Not only the companionable characteristics are described; the practical value of the cat is set down in the chapter "A Furry Mousetrap." The cat, according to Shakespeare, is a "harmless, necessary animal" which earns its living and pays its way perhaps as importantly, if not as dramatically, as any living animal. The book is a worthwhile addition to the growing literature on the cat.—[*Cats and People. By Frances and Richard Lockridge. Illustrated by Helen Stone. J. B. Lippincott Company, Philadelphia. Price $3.50.*]

What Patients Read

This new leaflet, prepared by the Schering Corporation, reviews briefly many articles on medicine and scientific subjects which appear in lay magazines, newspapers, and books. These are briefed so that physicians may quickly get the general picture of what the clients are reading and, thereby, be at least partially informed on the subjects which may come up during consultations between clients and their physician.

Complete Dog Record

The book provides a place to keep a complete and lasting record of the growth and development of a dog. Designed primarily for the owners of purebred registered dogs, there are provided record pages for the birth announcement, extended pedigree, identification, feeding chart, health record, growth record, training record, breeding record, show record, likes and dislikes, some outstanding characteristics, and photographs.

Based upon the ever popular human baby records, it would seem to offer an opportunity for similar recording of important facts concerning dogs. The distribution may be limited, but almost every veterinarian will have a few clients who might be interested in seeing a copy of the book and of keeping a similar record on their own pet.—[*Our Dog. Edited by Gene Waterman and E. H. Coles, D.V.M. Cloth. 28 pages. Frank Glenn Publishing Company, Inc., 107 West Eleventh Street, Kansas City, Mo. 1950. Price $2.50.*]

Mississippi Panorama

The City Art Museum of St. Louis, Mo., published this document, which is based on an exposition, staged by that museum, of life on the waters and on the banks of the Mississippi and the Missouri in the nineteenth century. It comprises 188 reproductions of excellent paintings and sketches, revealingly captioned and interpolated. —[*Mississippi Panorama. Edited by Perry T. Rathbone. Paper. 228 pages. City Art Museum, St. Louis, Mo. 1950.*]

REVIEWS OF VETERINARY MEDICAL FILMS

Every Dog a Gentleman.—Sound, 16 mm., black and white; running time about fifteen minutes. Produced by John A. Haeseler for, and available from, Gaines Dog Research Center, 250 Park Ave., New York 17, N. Y.

This film renders a worth-while service to dogs as well as their owners, because it stresses simplicity in early training and does not mislead new owners into trying to be overbearing taskmasters. Keys to the thinking that guided this presentation are the narrator's statements that "Simple training makes the difference between a well-behaved dog and a nuisance" and "Any breed of dog can be trained to be gentleman—or a lady."

Heel, stay, sit up, and other elementary points in training are portrayed, on through the more advanced acts of carrying and retrieving. Instruction is given in use of hand signals.

Many dog owners are like the bobbysoxer who visualizes a love affair with Clark Gable while ignoring a less glamorous but more obtainable boy in her own town. They get their concepts of training from seeing perfectionists in action at professional demonstrations and overlook the need for a basic approach to their own pet's conduct. "Every Dog a Gentleman" should be especially revealing to this group, and, in fact, it can be recommended with confidence for showing before any group interested in dogs. Veterinarians and veterinary medical students will appreciate it, too.

THE NEWS

Eighty-Eighth Annual Meeting
Milwaukee, Wis. – August 20-23, 1951

Plan State Fair Celebration to Honor AVMA Meeting

In recognition of the importance of veterinary medicine to the welfare of Wisconsin and the nation, directors of the Wisconsin State Fair are arranging a "Veterinarians' Day" to coincide with the AVMA convention.

Preliminary plans have been worked out by the Committee on Local Arrangements whereby Tuesday, Aug. 21, 1951, will be set aside for the celebration. This will not interrupt the scientific proceedings of the convention, since highlights of

Milwaukee Journal Photo

Airview of Lake Michigan coastline in Milwaukee, site of the Eighty-Eighth Annual Meeting of the AVMA, Aug. 20-23, 1951.

the state fair event will come at night when there are no scheduled sessions. The fair grounds are only a short distance from downtown Milwaukee, and transportation will be provided by chartered busses.

HOTEL RESERVATIONS

Notwithstanding that a record-breaking attendance is expected, there will be sufficient hotel rooms for everyone. However, immediate reservations are urged to assure getting choice accommodations. In making reservations, use the form on advertising page 41 of this issue. Since this will be an auditorium convention, there will be no headquarters hotel, and room allotments have been divided as evenly as possible among good hotels convenient to the auditorium.

Organization of the Committee on Local Arrangements was completed at a recent meeting in Milwaukee. At the same time, the women's group, under general direction of Mrs. E. A. Woelffer, was augmented by the appointment of Mrs. M. C. Klofanda, Milwaukee, general secretary; Mrs. F. W. Milke, Milwaukee, in charge of the annual luncheon; Mrs. K. G. Nicholson, Milwaukee, in charge of women's information; and Mrs. Claude H. Reading, who will head the reception committee.

Priority I Special Registrants (Classified 1-A) Advised to Apply for Commissions

The following memorandum was sent to the state and local advisory committees to Selective Service from the National Advisory Committee:

It is the recommendation of the National Advisory Committee that state and local advisory committees contact all special registrants in priority I who are classified 1-A and who answered negatively to the question, "I do ..... do not ..... apply for a commission," and urge these registrants to apply voluntarily for commissions at the earliest possible time.

Public Law 779 clearly states that all registrants in priority I who are classified 1-A shall be called for service before calls are made for registrants in priority II. Since it is obvious to the National Advisory Committee that there is need for the services of those special registrants in priority I who are

Committee on Local Arrangements, Milwaukee Meeting, Aug. 20-23, 1951

Front row (left to right)—Drs. G. J. Marold, Clyde D. Lyle, Fred W. Milke, and W. E. Lyle. Second row—Drs. R. O. Anderson, Gilbert Lewis, S. E. Ferguson, K. G. Nicholson, F. L. Gentile, and Walter Wisnicky.

Not present when picture was taken— Drs. C. W. Anderson, J. A. Wilson, and J. T. Schwab.

classified 1-A and have not applied for a commission, this group, in the opinion of the National Advisory Committee, may reasonably expect to be called for induction under the provisions of Public Law 779 as soon as calls are issued to Selective Service System.

This same recommendation was made in the February, 1951, JOURNAL, p. 124. However, as pointed out in the February, 1951, JOURNAL, this applies more specifically to the registrants whose appeal from 1-A classification was denied and especially if a recommendation from the state advisory committee was obtained and it *did not* recommend a change from the 1-A classification. On the other hand, registrants who are going to request delays in call to active duty after they have received their commission, and who are performing essential services, should not apply for commissions at the present time. At the time of this writing, no assurance has been received from the Department of Defense that the selection of Veterinary Corps Reserve officers for active duty will be based upon recommendations of the advisory committees. After April 1, 1951, the selection of Medical and Dental Corps reserves for active duty will be based on the recommendations of the advisory committees. The Department of Defense has been requested to follow the same system for the selection of Veterinary Corps Reserves for active duty.

Special Registrants in Priorities III and IV Will Not Be Classified Immediately

The executive secretary of the Rusk Advisory Committee to Selective Service stated in a meeting in Washington, D.C., Jan. 12, 1951, that special registrants who registered on January 15 will not be classified by local boards until it is necessary. Until there is a need to "dip" into priorities III and IV, these registrants will not be classified. The need to select veterinarians for military duty from priority III seems unlikely and surely will not become necessary unless the United States engages in an "all-out" war. Therefore, when the veterinarians who registered on January 15 will be classified, if ever, is not known.

Canadian Depository Established

The Executive Board, at the Miami Beach Convention, authorized the establishment of a Canadian Depository at the Bank of Montreal, Toronto, for the convenience of the Canadian members of the Association.

Committee on Women's Activities, Milwaukee Meeting, Aug. 20-23, 1951

Front row (left to right)—Mrs. L. R. Richardson, Mrs. F. W. Milke, Mrs. E. A. Woelffer, and Mrs. C. A. Brandly.
Standing—Mrs. K. G. Nicholson, Mrs. F. L. Gentile, Mrs. M. C. Klofanda, Mrs. R. O. Anderson, Mrs. G. J. Marold, and Mrs. C. H. Reading.

Specifically, this means that Canadian members may now remit their membership and subscription fees without making application for permit. Also, because of this new service, personal checks will be honored which will eliminate the necessity of purchasing money orders and making allowance for the prevailing exchange rate.

We believe that the export limitations and exchange rate have been a detriment to our Canadian members and that the establishment of the Canadian depository will be a definite convenience.

Send Nominations for Humane Act Award

Some North American boy or girl not over 18 years of age will be honored for outstanding kindness to animals at the opening session of the AVMA annual meeting in Milwaukee, Aug. 20, 1951.

"Youngsters' exceptional acts of kindness to animals often come to the attention of practitioners," said Dr. A. R. Theobald, of Cincinnati, chairman of the AVMA Humane Act Award Committee, "and we are urging veterinarians to send us nominations describing these kind deeds."

The award, inaugurated in 1944, honored a Canadian girl last year for consistently befriending homeless and injured animals of all kinds. On the spectacular side was an earlier winner who captured a rabid dog that had terrorized her neighborhood. The award consists of a $100 U.S. savings bond and a framed certificate describing the act of kindness.

Nominations may be sent either to the AVMA office or to Dr. A. R. Theobald, 4545 Reading Road, Cincinnati 29, Ohio. The deadline for nominations is May 1, 1951.

Ralston Purina Company Research Fellowship Awards

The Ralston Purina Company announces its research fellowship awards for the school year July 1, 1951, to June 30, 1952, to assist in the training of additional personnel for furthering the interests of agriculture, particularly the livestock and poultry industries. Awards of $1,440 annually will be made in the fields of (1) nutrition and physiology research as applied to dairy, poultry, and animal husbandry; and (2) research in transmissible diseases of livestock and poultry.

Any individual qualified for graduate study in any land-grant agricultural college or approved veterinary college (including Canadian colleges) who possesses desirable personal qualifications and submits a completed application may be eligible. This application and necessary requested information must be in the hands of the awards committee by March 1 of the year the award is to be made.

Research fellowships will be awarded on an annual basis. The recipient of an award may be eligible for appointment not to exceed a tenure of three years.

Not more than seven research fellowships shall be awarded annually, as follows: not more than two each in dairy husbandry, animal husbandry, and poultry husbandry; and not more than one in the field of veterinary science.

The selection of the recipients of the Annual Research Fellowship Awards, as well as the rules governing the awards, shall be made by a committee of an officially appointed representative of each of the following organizations: Poultry Science Association, American Veterinary Medical Association, American Dairy Science Association, American Society of Animal Production, Association of Land-Grant Colleges, and the Ralston Purina Company.

Application blanks for these awards may be obtained from the Ralston Purina Research Awards Committee, c/o Mr. J. D. Sykes, Ralston Purina Company, St. Louis 2, Mo.

AVMA Research Fellows

Jack E. Moulton was born March 4, 1922, at Seattle, Wash. He was educated at the State College of Washington (B.S., 1947; D.V.M., 1949). He then did graduate work in pathology at the University of Minnesota during 1949 and 1950, and was an instructor in animal pathology during that time. Work under his AVMA fellowship will be conducted at the University of Minnesota under J. R. Dawson, M.D.

Dr. Jack E. Moulton

PLAN OF THE PROJECT

The course work emphasizes pathology as this relates to tumors, surgical techniques, several organs of the body, and the virus infections.

It also embraces the study of hematology and neuro-anatomy. These courses will be divided between the School of Medicine and the School of Veterinary Medicine. At the School of Veterinary Medicine, Dr. Moulton will assist in pathology laboratory classes and will be present when autopsies are performed. He is also completing a histopathologic study of canine mammary tumors, which was started before he entered upon his fellowship.

The experimental problem of the fellowship will center around the histopathologic aspects of rabies, and especially as they relate to the formation and structure of the Negri body.

STUDENT CHAPTER ACTIVITIES

California Chapter.—The University of California Student Chapter of the AVMA opened the 1950-1951 school year with a smoker to welcome the 52 freshmen. President Delbert Anthony introduced the officers and each of the new students. The freshmen were then taken on a tour of the veterinary school buildings by members of the staff. Dean George Hart spoke briefly on the history of the University of California School of Veterinary Medicine and introduced members of the teaching staff.

The following officers, elected at the end of the spring semester, 1950, served during the fall semester: Delbert O. Anthony, president; Aaron L. Andrews, president-elect, Benjamin V. Lundberg, vice-president; Wing Q. Chin, secretary; James L. Bittle, treasurer.

A business meeting was held November 2, at which reciprocal visits with the medical school, graduate status, draft status, etc., were discussed. On October 16, Dr. H. C. Bendixen of the Royal Veterinary and Agricultural College, Copenhagen, Denmark, described the organization of the veterinary profession in the Scandinavian countries. The Chapter budget was presented for approval at the December 7 meeting. Dr. Agnes Fay Morgan, University of California Department of Biochemistry, Berkeley, discussed "Nutrition and the Dog" at the December 11 meeting.

On Jan. 4, 1951, Mr. Carl Hansen, Standardbred breeder of Stockton, discussed the history of the harness horse, methods of racing, and the all-around usefulness of the harness horse. He emphasized the need for close relationship between farmers and veterinarians. The following officers were elected at the January 8 meeting: Charles H. Burger, president-elect; Allen H. Davis, vice-president; Gene Tobias, secretary; and Thomas B. Condon, treasurer.

S/WING Q. CHIN, *Secretary.*

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Illinois Chapter.—The Illinois State University Chapter of the AVMA has elected the following officers to serve for the spring semester of 1951: Cecil R. Johnson, president; George C. Scott, president-elect; Oliver W. Stowe, vice-president; Robert K. Etheridge, treasurer; John A. Buckler, secretary.

S/GLENN L. WAXLER, *Secretary.*

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Iowa State Chapter.—During 1950, as in the preceding years, the Speaker's Committee of the Iowa State Student Chapter of the AVMA has endeavored to bring before the students and faculty a number of speakers representing various phases of veterinary medicine and related fields.

At the Oct. 11, 1950, meeting, Alan Raun, senior, told some of the highlights of his trip to the Miami Beach meeting of the AVMA. Dr. John K. Dewar, Cherokee, president of the Iowa Veterinary Medical Association, addressed the group at the November 14 meeting. On December 6, Dr. W. E. Petersen of the Department of Dairy Husbandry, University of Minnesota, was guest speaker. Dr. R. C. Klussendorf, editor-in-chief of AVMA publications, Chicago, spoke on "The AVMA, the Junior AVMA, and You" at the Jan. 22, 1951, meeting.

S/WAYNE A. DANKER, *Chairman, Speakers Committee.*

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Kansas Chapter.—A review of the activities of the Kansas State Student Chapter of the AVMA for the fall semester of the 1950-1951 school year follows.

Speakers and their subjects at the various meetings were Dean E. E. Leasure: "Ethics of the Profession"; Dr. Larry E. McClaughry, Arlington, Neb.: "Problems of General Practice"; Mr. Evan Griffith, local banker: "Economic Trends and Their Relationship to the Veterinarian."

Robert W. McNabb received the Borden Award for 1950, and Norman S. Wolf received the Alpha Zeta Freshman Award.

Films showed included "A Trip Through a Pig Factory," movies of the Kansas State vs. Nebraska football game, and "What of Tomorrow."

A feature of each meeting was a review of their summer "internship" by 2 seniors.

Social activities included entering a float in the Homecoming Day Parade, which received second prize, and the Women's Auxiliary annual Christmas Party at the country club.

Chapter officers are Raymond Swart, president; Jack T. Smith, vice-president; Dennis Goetsch, treasurer; and Herbert Schoonover, secretary.

S/JAMES G. CRIPPEN, *Publicity Committee.*

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Missouri Chapter.—The University of Missouri Student Chapter of the AVMA met in the auditorium of the veterinary hospital

clinic Jan. 8, 1951. The film "Battling Brucellosis" was shown. The following officers were elected for the spring semester: John W. Pierce, president-elect; Richard W. Hughes, vice-president; Ernest E. Burgess, secretary; Clifton N. Murphy, treasurer.

S/ERNEST E. BURGESS, *Secretary.*

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Presentation of Charter.—The Student Chapter of the American Veterinary Medical Association at Ontario Veterinary College, Guelph, met Friday afternoon, Jan. 12, 1951, to install new officers and receive the official charter for the chapter.

The officers installed were: L. E. Glenny, president; T. T. Wright, president-elect; J. E. McGowan, secretary; and R. E. Coleman, treasurer. The meeting was conducted by the retiring president, J. A. Greenway.

The installation charge to the new officers and the formal presentation of the charter were performed by Dr. R. C. Klussendorf, editor-in-chief of AVMA publications, representing the parent organization.

WOMEN'S AUXILIARY

Mrs. Richardson, Third Vice-President.—Mrs. L. R. Richardson, 1089 West Main Street, Ravenna, Ohio, a native of Pennsylvania, taught school in New Cumberland, Pa., before she married Dr. L. R. Richardson. They now have a son,

Mrs. L. R. Richardson

Jay, 9 years old. Mrs. Richardson is active in civic affairs, having served as a member of the Ravenna City Council, as secretary of the community chest, and as president of the Ravenna Junior Garden Club and of the Executive Board of the Ravenna Federation of Women's Clubs. She is a member of the First Methodist Church, is on the Church Board of Education, and is advisor to the Young Women's Group.

Mrs. Richardson is interested in the veterinary profession and has done fine work in both the state and national auxiliaries. She is secretary-treasurer of the Women's Auxiliary to the Ohio Veterinary Medical Association, and was appointed delegate from Ohio to the Auxiliary House of Representatives in Miami Beach in August, 1950. The Women's Auxiliary to the AVMA is fortunate to have Mrs. Richardson serve as third vice-president, and thus assume the responsibility for acting as liaison officer from the executive board to the local committee in Milwaukee, where plans are already under way for the annual meeting in August.

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Maine Auxiliary.—Eighteen members attended the annual meeting of the Women's Auxiliary to the Maine Veterinary Medical Association at the Lancey House, Pittsfield, on Jan. 10, 1951.

President Mrs. R. E. Libby, Richmond, gave an interesting report on the New England Convention, and Mrs. A. E. Coombs, Skowhegan, vividly portrayed the meeting of the national Auxiliary in Miami Beach.

Mrs. C. F. Davis, Rumford, chairman of the nominating committee, named the following officers who were elected for 1951: Mrs. Lewis B. Denton, Dover-Foxcroft, president; Mrs. James A. Elliott, Bangor, president-elect; Mrs. Alfred E. Coombs, Skowhegan, vice-president; and Mrs. Stanford D. Merrill, Augusta, secretary-treasurer. The mesdames J. Franklin Witter, Orono, chairman; Edward C. Moore, Lewiston; and Sidney W. Stiles, Falmouth Foreside, were elected to the executive board.

Mrs. Libby presented the auxiliary with a gavel and turned over the meeting to the new president, Mrs. Lewis Denton.

Mrs. Denton appointed Mrs. R. E. Libby the Maine delegate to the national Auxiliary House of Representatives at its 1951 meeting in Milwaukee. Mrs. L. V. Batchelder, Presque Isle, is the alternate.

S/MRS. STANFORD D. MERRILL, *Secretary.*

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Ohio Auxiliary.—The Women's Auxiliary to the Ohio State Veterinary Medical Association met Jan. 3-5, 1951, in the Deshler-Wallick Hotel, Columbus, with 154 in attendance. The social program included an audience-participation television show and breakfast at the Town and Country Room in The Neil House, social hour in the Hall of Mirrors, cards, movies, and the annual banquet.

At the business session, it was voted to continue the annual contribution to the library fund for the College of Veterinary Medicine at The Ohio State University, and also to

continue the loan fund for veterinary students which was established by the Auxiliary last year. New officers are Mrs. V. L. Tharp, Columbus, president; Mrs. Charles Griffin, Springfield, vice-president; and Mrs. L. R. Richardson, Ravenna, secretary-treasurer.

s/MRS. L. R. RICHARDSON, *Secretary.*

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Nebraska Auxiliary.— The Women's Auxiliary to the Nebraska State Veterinary Medical Association held its annual meeting at the Hotel Cornhusker in Lincoln on Dec. 5-7, 1950. The social program included a bridge and canasta party and luncheon in the Georgeon Room. Mrs. H. Gross, the president, presided at the business meeting. Mrs. E. C. Jones, delegate, gave a report of the Miami Beach meeting. The following officers were elected: Mrs. J. D. Cady, Arlington, president; Mrs. G. L. Schaefer, Tekamah, vice-president; and Mrs. J. L. George, Chester, secretary-treasurer.

s/MRS. H. GROSS, *President.*

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Southeastern Wisconsin Auxiliary.—At the November meeting of the Southeastern Wisconsin Veterinary Medical Association, the 28 women present voted to form an auxiliary to the Association. Mrs. H. L. Marsh, Whitewater, was elected president; Mrs. Kenneth Lloyd, West Bend, vice-president; Mrs. V. R. Bauman, Watertown, secretary-treasurer; and Mrs. G. J. Dedolph, Mayville, publicity agent.

s/MRS. G. J. DEDOPLH, *Publicity Agent.*

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Vermont Auxiliary.—Twenty-one members attended the annual winter meeting of the Women's Auxiliary to the Vermont State Veterinary Medical Association. New officers of the Auxiliary are Mrs. D. A. Walker, Morrisville, president; and Mrs. W. D. Bolton, Burlington, secretary-treasurer.

s/MRS. W. D. BOLTON, *Secretary.*

APPLICATIONS

The listing of applicants conforms to the requirements of the Administrative By-Laws—Article X.

First Listing

BAKER, DONALD C.
Box 887, Sidney, Mont.
D.V.M., Iowa State College, 1950.
Voucher: E. A. Tunnicliff.

BOWLBY, GRANT L.
Belmont, Ont.
D.V.M., Ontario Veterinary College, 1950.
Vouchers: F. S. Cote and T. L. Jones.

BOYCE, G. K.
S.P.O. #9, London, Ont.
D.V.M., Ontario Veterinary College, 1942.
Vouchers: T. L. Jones and J. E. Johnson.

DEVALOIS, DONALD G.
Sanborn, Iowa.
D.V.M., Iowa State College, 1944.
Voucher: F. B. Young.

FREEMAN, ROBERT F.
404 E. 5th St., Canton, S. Dak.
D.V.M., Iowa State College, 1937.
Voucher: R. M. Scott.

GREENE, RUDOLPH
Greenacres, Brighton, Ill.
D.V.M., U.S. College of Veterinary Surgeons, 1920.
Voucher: A. G. Misener.

KALVAITIS, ALFONSAS
112 Eastern Ave., Augusta, Maine.
D.V.M., Tieraerztliche Hochschule, Vienna, 1934.
Voucher: S. D. Merrill.

LANGILL, WILLIAM J.
6325 cote de Liesse Rd., Dornal, Que.
D.V.M., Ontario Veterinary College, 1950.
Vouchers: T. L. Jones and C. B. Baker.

MCKAY, ALAN G.
44 Long Branch Ave., Long Branch, Ont.
D.V.M., Ontario Veterinary College, 1949.
Vouchers: T. L. Jones and L. Q. Smith.

MIDDLETON, RONALD B.
1656 S. Oak Ave., Freeport, Ill.
D.V.M., Ontario Veterinary College, 1950.
Vouchers: T. L. Jones and H. E. Held.

ROSS, CHARLES P.
Bel Air, Md.
D.V.M., Ohio State University, 1941.
Voucher: J. D. Gadd.

SANDERS, JACK M.
307 S. Wellington St., Marshall, Texas.
D.V.M., Texas A. and M. College, 1945.
Voucher: E. A. Grist

SLAVIK, NORMAN R.
Coldwater, Ohio.
D.V.M., Ohio State University, 1945.
Voucher: F. J. Kingma.

Second Listing

BUNNELL, ORVAL E., Box 132, Worland, Wyo.
CORCORAN, JOHN R., 1934 6th Ave., Scottsbluff, Neb.
ELLIOTT, A. REDMOND, P.O. Box 644, Camrose, Alta.
GREEN, WILLIAM S., Rt. 1, Box 222, Mercer Island, Wash.
JARVIS, CARL H., Box 562, Chatham, N.B.
KEANE, HENRY J., Box 1487, Cristobal, C.Z.
KENNEDY, CHESTER H., 884 7th St., Elko, Nev.
LARSON, LEONARD A., West Liberty, Iowa.
LUDGATE, THOMAS B., Flandreau, S. Dak.
KRAL, FRANTISEK, 4114 Pine St., Philadelphia 4, Pa.
PROPP, GEORGE J., 1403 N. Monroe Ave., Loveland, Colo.
SCOBELL, ELGIN S., 137 W. Washington, Wausau, Wis.

U. S. GOVERNMENT

Veterinary Personnel Changes.—The following changes in the force of veterinarians in the U.S. Bureau of Animal Industry are reported as of Jan. 12, 1951.

NEW APPOINTMENTS

Harlan D. Ellis, Kansas City, Kan.
George C. Faun, Cleveland, Ohio.
Clarence K. Fellman, Mexico City, Mex.
Robert G. Freel, Mexico City, Mex.
Thomas A. Gage, San Antonio, Texas.
Charles A. Hazzard, Newark, N. J.
Walter Heiner, Mexico City, Mex.
Charles M. Johnson, Louisville, Ky.
Floyd A. Lockwood, Sioux City, Iowa.
Charles D. Stumpff, Kansas City, Kan.
Hendrik Versluis, Salt Lake City, Utah.
Samuel F. Zickefoose, Topeka, Kan.

RESIGNATIONS

David H. Fennoy, Columbus, Ohio.
Scott Haggard, Fort Worth, Texas.
Raymond R. Houser, Los Angeles, Calif.
Eric W. Linder, Los Angeles, Calif.
Richard E. Matteson, Mexico City, Mex.
Robert Mitchell, Jr., Cincinnati, Ohio.
George M. Rose, San Antonio, Texas.
George H. Starr, Richmond, Va.
Charles Weiner, Olympia, Wash.
Frederick J. Weitz, Buffalo, N.Y.

RETIREMENTS

Bert L. Dawson, South St. Joseph, Mo.
Orin L. DeVore, Billings, Mont.
Hugh M. O'Rear, Harrisburg, Pa.
Ben H. Steigleder, Chicago, Ill.

TRANSFERS

Lewis L. Jackson, from Mexico City, Mex., to St. Louis, Mo.

Roland S. McKenzie, from Mexico City, Mex., to Indianapolis, Ind.

Louie E. Porch, from Mexico City, Mex., to Ottumwa, Iowa.

Ralph P. Reid, from Mexico City, Mex., to Little Rock, Ark.

James P. Torrey, from Washington, D.C., to Beltsville, Md.

MILITARY FURLOUGH

Charles M. Barnes, Baton Rouge, La.
William H. Bassett, Omaha, Neb.
Fred Storz, Kansas City, Kan.

TERMINATION

Charles A. Curtis, Albuquerque, N.M.

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U.S. Clears Way for Importing Mexican Canned Meat.—Effective Dec. 30, 1950, an amendment to federal meat inspection regulations added Mexico to the list of countries from which certain meats, including canned and cooked meats and meat-food products, may be imported into the United States.

According to USDA officials, this means that the meat-inspection system recently established in Mexico is recognized as "the substantial equivalent of the system now in operation in the United States." The amendment, however, does not alter present restrictions on entry of fresh, chilled, or frozen meats from Mexico. Such meats can not be shipped into the United States from any country where foot-and-mouth disease is known to exist.

Addition of Mexico makes a total of 30 countries from which meats and meat-food products are eligible for importation subject to inspection by the U.S. Bureau of Animal Industry.

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Laboratory Courses at Communicable Disease Center.—The 1951 schedule of laboratory training courses at the Communicable Disease Center, U.S. Public Health Service, Atlanta, Ga., opened with a course in laboratory diagnosis of syphilis on February 23 and will end with diagnosis of tuberculosis November 19. Laboratory diagnosis of parasitic diseases, bacterial diseases, blood parasites, enteric diseases, and rabies are among the courses included in the annual schedule. Further information and applications should be requested from the Officer in Charge, Laboratory Training Services, Communicable Disease Center, U.S. Public Health Service, P. O. Box 185, Chamblee, Ga.

AMONG THE STATES AND PROVINCES

Arizona

Pima County Association.—The Pima County Veterinary Medical Association held its regular monthly dinner meeting at the Rancho Nezhone in Tucson, Jan. 17, 1951. Guest speakers were Miss Jeanette Brown, president of the Tucson Humane Society, and Major N. Eggling, psychiatrist stationed at Davis Monthan Air Base, who presented a talk on the "Medical Aspects of Nuclear Energy." Dr. R. W. Adami was chairman of the meeting. s/R. W. ADAMI, *Resident Secretary.*

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Dr. Hight, State Veterinarian.—Dr. H. G. Hight, Tempe, has been appointed state veterinarian by Arizona's new Governor Howard Pyle. Dr. Hight replaces Dr. Frank D. McMahon who passed away Nov. 25, 1950.

s/R. W. ADAMI, *Resident Secretary.*

California

State Association.—The veterinary conference and midwinter meeting of the California State Veterinary Medical Association was held Jan. 22-24, 1951, at the School of Veterinary Medi-

cine, University of California, Davis. The following program was presented. Speakers not otherwise identified are on the staff of the School of Veterinary Medicine, University of California, Davis.

Dr. J. M. Arburua, practitioner, San Francisco: "The History of Veterinary Education."

Dr. Herald R. Cox (Sc.D.), director of viral and rickettsial research, American Cyanamid Company, Pearl River, N.Y.: "Modification of Viruses."

Dr. Myron Thom, practitioner, Pasadena: "Radiotherapy in Veterinary Practice."

Dr. Charles W. Cotterman, associate geneticist, Heredity Clinic, University of Michigan, Ann Arbor: "Inherited Abnormalities."

Dr. R. W. Redding: "Laminectomy in the Dog."

Dr. W. F. Irwin, Beverly Hills, Calif.: "Uterine Infections in the Bitch" and "The Clinical Laboratory in Practice." Dr. O. W. Schalm led the discussion of the latter paper.

Dr. K. J. Petersen, practitioner, Salem, Ore.: "Surgical Correction of Cataract" and "Brucellosis Control in the Willamette Valley."

Dr. L. W. Holm (Ph.D.): "Cortisone Investigations."

Dr. C. N. Bramer, practitioner, Evanston, Ill.: "Economics of Small Animal Practice."

Dr. J. E. Craige, practitioner, Seaside, was moderator of a panel discussion on "Infectious Hepatitis and Related Diseases." Other panel members were Drs. T. J. Hage; G. W. McClintock, practitioner, West Hollywood; and N. L. McBride, practitioner, Pasadena.

Dr. Hardin B. Jones, assistant professor of medical physics and physiology and assistant director of Donner Laboratory, University of California, Berkeley: "Atherosclerosis."

Dr. J. W. Kendrick: "Some Aspects of Tibial Fractures" and "The Present Status of Vibriosis in Cattle."

Dr. J. D. Wheat: "Bovine Surgery."

Dr. M. G. Fincher, Department of Veterinary Medicine, Obstetrics and Ambulatory Clinic, New York State Veterinary College, Cornell University, Ithaca: "Current Problems in Bovine Practice" and "Infertility in Dairy Cattle."

Dr. Robert Ormsbee, practitioner, Stockton: "The Herd Approach to Dairy Cattle Problems."

Dr. P. T. Cupps (Ph.D.), assistant professor, Department of Animal Husbandry, University of California, Davis: "Observations on Reproductive Problems."

Dr. J. W. McLean, associate professor of agriculture, Christ Church, New Zealand: "Aspects of Bovine Sterility in New Zealand."

Dr. P. D. DeLay, livestock pathologist, California State Department of Agriculture, Sacramento: "Recent Epizoötic Bovine Abortions in California." Dr. H. S. Cameron led the discussion of this paper.

Dr. Max Kleiber (D. Sc.), professor of animal husbandry, University of California, Davis: "Isotopes as Metabolic Tracers."

Dr. E. H. Lennette (M.D.), California State Department of Public Health, Berkeley: "Q Fever in California." Dr. Herald R. Cox led the discussion of this paper.

Dr. K. F. Meyer, (D.V.M., M.D.), director, George Williams Hooper Foundation for Medical Research, San Francisco: "Old and New Heterogenous Infection Chains."

Among the demonstrations were cesarean section of the cow, anterior vena cava bleeding of swine, *Trichomonas fetus* in fresh specimens, use of the electrocardiograph in the dog, and correction of fracture of the tibia of the cow by external skeletal fixation in combination with plaster.

s/CHARLES S. TRAVERS, *Executive Secretary.*

Smoke Nuisance.—Ever since Adam took the bite from the forbidden apple, man has been fabricating excuses for his shortcomings. By 1950, he had become quite accomplished.

A number of excuses (financial, retired) have arrived in the AVMA office as reasons for not joining the national Association. Some are more original. We quote herewith one of the latter:

"I am not interested because nearly all [members] smoke cigarettes and I can't stand the smoke, so I can't attend."

Colorado

Dr. Newsom Studying in Europe.—Dr. I. E. Newsom, former dean of the Division of Veterinary Medicine, Colorado A. & M. College, Fort Collins, is studying diseases of animals in European countries under the sponsorship of the Marshall Plan (ECA).

Delaware

Dr. Gardiner Accepts Position at Experiment Station.—Dr. Meredith R. Gardiner (UP '40) has accepted a position as assistant poultry pathologist at the University of Delaware Agriculture Experiment Station, Newark. Dr. Gardiner was pathologist at the Georgia Coastal Plains Experiment Station before coming to the University of Delaware. He will devote his full time to the respiratory diseases of chickens as they are encountered in the Delaware broiler industry.

s/E. F. WALLER, *Department of Poultry Industry.*

Georgia

Southern Association.—On Jan. 21, 1951, the South Georgia Veterinary Medical Association met in Albany. The following scientific program was presented.

Dr. C. C. Rife, Atlanta, secretary of the Georgia State Veterinary Medical Association: "The Doctor Draft as it Applies to Veterinarians."

Drs. R. A. Houston, Blakely, and Grady Young, Thomasville: "The Use of the Two-Way Radio in Veterinary Practice."

Captain E. P. Hornickel, Turner Air Force Base: "Medical Aspects of Nuclear Fission."

Dr. C. C. Sapp, Jr., Albany, was moderator of a panel discussion on various aspects of veterinary practice. Panel members included Drs. C. C. Rife; S. F. Stapleton, Americus; W. D. Martin, Jr., Albany; and J. B. Crane, Valdosta. Subjects discussed included the percentage of fertile freemartins, zoo practice, leptospirosis, head abscesses in dogs, winter dysentery of cattle, chronic bloat, and central nervous diseases of cattle.

Dr. Lash, Sioux City, Iowa: "Variant Hog Cholera Virus."

Chairman G. C. Toliver, Albany, appointed Drs. W. D. Martin (chairman), Albany; Joe Crane, Valdosta; and Bronze Youmans, Waycross, as a program committee for 1951.

s/C. C. RIFE, *Resident Secretary.*

Illinois

Eastern Association.—The winter meeting of the Eastern Illinois Veterinary Medical Association was held at the Hotel Tilden Hall, Champaign, Dec. 4, 1950. A round-table discussion of veterinary medical fees was presented. Members of the panel were: Mr. L. H. Simerl, associate professor of agricultural economics, University of Illinois; Mr. Frank Hartenstein, Pitman-Moore Company; Dr. F. E. Bartley, Sidell; and Dr. D. E. Sisk, Mansfield. President T. H. Brasmer was moderator.

s/H. S. BRYAN, *Assistant Professor, College of Veterinary Medicine.*

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Chicago Association.—At the Jan. 9, 1951, meeting of the Chicago Veterinary Medical Association in the Palmer House, Dr. Wayne H. Riser was moderator of a symposium on "Bone Tumors." Symposium speakers and their subjects were: Dr. E. C. Khuen, "Osteosarcoma in a Puppy." Dr. J. W. Neff, "Osteosarcoma in an Aged Animal." Dr. T. J. LaFever, "Sarcoma in a Great Dane." Dr. C. L. Miller, "Three Cases of Osteosarcoma." Dr. R. E. Storm, "Diagnosis and Treatment of Tumors by Radiography."

New officers of the Association are Drs. P. J. Meginnis, president; J. K. Bone, president-elect; and Robert C. Glover, secretary-treasurer.

s/ROBERT C. GLOVER, *Secretary.*

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Comparative "Unethics."—The other day in a conversation, a veterinarian spoke of "the quacks of the nineteenth century." What a laugh!

Shortly after the passage of the state's veterinary licensure law at the turn of the century (1899), the State Board of Veterinary Examiners, thereby created, published the names and addresses of its 1,563 licentiates. Of these, 1,090 were veterinary college graduates and 473, or 30 per cent, were licensed on the basis of self-education, so-called "nongraduates." Glancing through the list, one can recognize about 35 government employees, most of them located at the Chicago and East St. Louis abattoirs. Metropolitan Chicago (*i.e.*, Cook County) had a total of 253 of whom 18, or about 7 per cent, were nongraduates, whereas down state had 1,310 of whom 455, or 35 per cent, were not graduates. The few who were publicly employed do not materially change the percentages. But what is materially significant is that, while the total of nongraduates has declined during the past half century, owing to deaths, the unethical who prey on the honor of the profession by advertising their wonderful selves in telephone directories and otherwise have increased. Even the "quacks of the nineteenth century" would have been shocked at the sort of ethics now displayed, unashamed, by some graduate veterinarians.—L.A.M.

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Canine Research Farm.—The research kennels of the Gaines Division of the General Foods Corporation, now located at Ridgefield, Conn., are being established on a larger scale at Kankakee where a 200-acre plot has been acquired from the Kankakee Valley Recreation Association for the development. The new plant is located on Hieland Road, a mile south of Highway 17 on the outskirts of the city. The departure is a veritable experiment station on all phases of dog life: breeding, feeding, training.

Indiana

State Association.—The sixty-seventh annual convention of the Indiana Veterinary Medical Association was held at the Severin Hotel, Indianapolis, Jan. 10-12, 1951. The scientific program follows.

Dr. Deets Pickett, Kansas City, Mo.: "Medical Procedures in Small Animal Practice" and "Surgery in Small Animals, with Emphasis on Use of Curare" (with illustrations).

Dr. Carl A. Bunde (Ph.D., M.D.), director of research, Pitman-Moore Company, Indianapolis: "The Parenteral Use of Water and Salt Water."

Dr. O. G. Wegrich (Ph.D.), head, Microbiological Pilot Plant, Commercial Solvents Corporation, Terre Haute: "Ramification in the Field of Medical Mycology."

Dr. E. A. Woelffer, practitioner, Oconomowoc, Wis.: "Reproductive Diseases in Dairy Cattle" and "Highlights in Dairy Cattle Practice."

Dr. W. L. Ingalls, Department of Veterinary Pathology, College of Veterinary Medicine, The Ohio State University, Columbus: "Field Differential Diagnosis of Common Respiratory Diseases."

Dr. Vernon L. Tharp, director of clinics, College of Veterinary Medicine, The Ohio State University, Columbus, showed and discussed the films "Clinical Cases from the Veterinary Clinic" and "Obstetrics in Cattle."

Dr. A. G. Madden, Jr., practitioner, Madeira, Ohio: "A Day in the Life of a Veterinarian."

Dr. F. B. Young, secretary, Iowa Veterinary Medical Association, showed the film "Public Relations and Economics."

Dr. W. A. Aitken, practitioner, Merrill, Iowa: "Swine Practice" and "Swine Erysipelas in Northwest Iowa."

Dr. L. P. Doyle, associate pathologist, Department of Veterinary Science, Purdue University, LaFayette: "Rheumatoid Disease of Swine."

Dr. J. E. Briggs, Department of Animal Husbandry, Purdue University: "Recent Advances in Nutrition as They Apply to the Veterinarian."

Dr. W. M. Coffee, LaCenter, Ky., president of the AVMA: "The American Veterinary Medical Association."

Dr. L. M. Hutchings, head, Department of Veterinary Science, Purdue University: "Swine Brucellosis Control Plan."

The following officers will serve the association for the ensuing year: Drs. G. R. Oldham, Kokomo, president; M. M. Coble, Columbia City, president-elect; E. W. Spieth, Jeffersonville, vice-president; W. W. Garverick, Zionsville, secretary-treasurer. Dr. H. D. Carter, Fairmount, was appointed delegate to the AVMA House of Representatives, with Dr. George W. Gillie, Fort Wayne, as alternate.

s/J. L. KIXMILLER, *Resident Secretary.*

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Northeastern Association.—The Northeastern Indiana Veterinary Medical Association met in Fort Wayne Dec. 12, 1950. Members enjoyed the Christmas party, songs, and the exchange of gifts. Officers elected at this meeting are Drs. F. M. Williamson, Bluffton, president; R. E. Allison, Decatur, vice-president; Clark Waterfall, Columbia City, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Southwestern Association.—The Southwestern Indiana Veterinary Medical Association met in Fort Branch Dec. 15, 1950, for the annual Christmas party. Officers elected for the new year are Drs. M. S. Sheehey, Washington, president; B. F. Mauck, Jr., Boonville, vice-president; J. E. Swonder, Vincennes, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Tenth District Association.—The Tenth District Veterinary Medical Association met Dec. 21, 1950, in Newcastle to hear Dr. R. V. Johnston, Zionsville, speak on "Enterotoxemia of Sheep" and "Prevention of Perfringens D by Using Antitoxin and Bacterins." New officers of the association are Drs. W. E. Welbourn, Winchester, president; L. A. Snider, New Palestine, vice-president; John Templeton, McCordsville, secretary-treasurer. Dr. A. Danforth, Winchester, was elected to the Board of Directors.

s/J. L. KIXMILLER, *Resident Secretary.*

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Wabash Valley Association.—On Dec. 13, 1950, members of the Wabash Valley Veterinary Medical Association met in Marion to hear Dr. L. M. Hutchings, Department of Veterinary Science, Purdue University, discuss "What Is To Be Expected from the Veterinarians by the Livestock Industry and Army During the Approaching Years." New officers of the Association are Drs. A. L. Keim, Kokomo, president; Robert C. Smith, Kokomo, vice-president; Donald J. Myers, Wabash, secretary-treasurer.

s/J. L. KIXMILLER, *Resident Secretary.*

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Personal.—Mrs. U. B. Reynolds, Fort Branch, passed away early in December, 1950. Dr. and Mrs. U. B. Reynolds celebrated their golden wedding anniversary July 29, 1950.

s/J. L. KIXMILLER, *Resident Secretary.*

Louisiana

State Association.—The twentieth annual conference for the Louisiana State Veterinary Medical Association was conducted by the Department of Veterinary Science at the Louisiana State University and A. & M. College, Baton Rouge, Jan. 23-24, 1951. The scientific program follows.

Dr. L. M. Hutchings, head, Department of Veterinary Science, Purdue University, LaFayette, Ind.: "Enteric Diseases of Swine" and "Can We Lick Brucellosis?"

Dr. H. M. Spangler, practitioner, Austin, Texas: "The Cat as a Veterinary Patient" and "Partnership Veterinary Medicine."

Dr. J. B. Frye, Jr., head, dairy department, Louisiana State University, Baton Rouge: "Raising the Dairy Calf."

Drs. A. R. Choppin and C. S. Simons: "Louisiana Radiological Defense."

Drs. R. B. Gochenour, assistant director, Biological Division, Pitman-Moore Company, Indianapolis, Ind.: "Recent Advances in the Field of Biologic Products."

The following motion pictures were shown: "Trip Through a Pig Factory" (furnished by Ralston-Purina Mills); "Lungworm Disease" (USDA Regional Laboratory, Auburn, Ala.); "Outbreak, A Story of Foot-and-Mouth Disease;" "Prairie Wings."

Dr. E. J. Meixel, U.S. BAI, New Orleans, was toastmaster at the annual banquet.

s/R. B. LANK, *Secretary.*

Maine

State Association.—The Maine Veterinary Medical Association held its annual meeting Jan. 10, 1951, in the Lancey House, Pittsfield, with 35 veterinarians in attendance. The program speakers and their subjects were:

Mr. Albert Harmon, Continental Casualty Company: "Group Accident and Health Insurance."

Mr. Harry B. McKenney, Machias, state racing commission: "Problems of Saliva Testing."

Dr. R. C. Klussendorf, Chicago, editor-in-chief of AVMA publications, was guest speaker at the banquet. His topic was "Veterinary Medicine Twenty Years from Now" (with illustrations). Dr. Klussendorf also answered questions on group insurance, military service, veterinary graduates of foreign schools, and cattle practice.

The officers were reëlected for the ensuing year as follows: Drs. L. B. Denton, Dover-Foxcroft, president; A. E. Freeman, Rumford, vice-president; S. D. Merrill, Augusta, secretary-treasurer. Drs. A. E. Coombs, Skowhegan; E. C. Moore, Lewiston; and P. R. Brown, Belfast, executive committee.

s/S. D. MERRILL, *Secretary.*

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Northeastern Mastitis Council.—The second annual meeting of the Northwestern Mastitis Council was held in the new animal pathology building at the University of Maine Nov. 14, 1950, and was attended by about 40 laboratory workers and state officials, concerned with mastitis control programs, from as far south as Delaware and Pennsylvania. Several veterinary practitioners participated in the program, including Dr. Robert Ingham, Waterville. Other Maine veterinarians attending were President L. B. Denton, Dover-Foxcroft; Drs. J. Elliott, Bangor; P. R. Brown, Belfast; H. N. Eames, Brunswick; State Veterinarian Raymond Libby; and Federal Veterinarian Bert Cady.

Papers and discussions centered around standardization of laboratory tests; role of specific infections in control programs; reports on control programs now in progress in each state represented; etiology of mastitis; new agents used in therapeutics of mastitis; importance of the veterinary practitioner in the mastitis control program; control of the sale of infected cows; and the role of milking machines in the control of the infection.

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Ye Olden Times.—In *The Maine Veterinarian,* Dr. William S. Lord (HAR '90), Portland, reminisces about the veterinary profession when his D.V.M. degree was brand new and he set out to earn a living with it. Dr. Lord prefaces his reflections with "In the first place, I want to say that a man in those days had to be tough." Roads as we know them did not exist. Dr. Lord carried a shovel as part of his equipment when he went out on a call. In winter, if the horse stepped to one side of the trail, it might flounder or be lost completely. In the spring, mud 6 or 7 in. deep replaced the snow hazard; and in the summer there were several inches of sand with just one rut and if you met anyone and had to pull to one side, you were apt to wrench the spokes from the wheels.

Veterinary medicine, in those days, was different too. "When a cow was sick, they would often bore holes in the horns and fill them with tar and call it 'horn sickness,' and if a cow was off feed, they would say she had lost her cud, and would roll up fish skins tied with twine and push this down the throat to serve as a cud." The veterinarian had to be prepared to do almost anything, including removing and replacing horseshoes.

"There were no laboratories to get out my decisions . . . as they do today. Also you had to get together your own formulas and put them together when you got the chance as there was no place in the country to get anything. . . . I shall never forget the first capsule I got hold of—that surely was a great relief.

"This is very interesting work to me, but I have had to give it up as I can not go any further" says Dr. Lord who has passed his eighty-ninth birthday, and who has watched, and helped, the veterinary profession attain its present stature.

Massachusetts

State Association.—More than thirty members attended the December, 1950, meeting of the Massachusetts Veterinary Association at the Hotel Beaconsfield, Brookline. Dr. Todd O. Munson, the Angell Memorial Animal Hospital discussed "Diseases of the Anal Glands" and Dr. Marvin Rothman, also of the Angell Memorial Animal Hospital, presented a paper on "Poisoning Due to the Newer Parasiticides: A Review."

s/C. LAWRENCE BLAKELY, *Secretary.*

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Dr. Schnelle New Chief of Staff at Angell Memorial Hospital.—Dr. Eric H. Hansen, president of the Massachusetts Society for the Prevention of Cruelty to Animals, Boston, has announced the appointment of Dr. Gerry B. Schnelle (UP '26) as chief of staff of the Society's Angell Memorial Animal Hospital to succeed Dr. Erwin F. Schroeder, who has retired from active duty, although remaining on the staff in an advisory capacity. At the same time, Dr. Schnelle was appointed director of veterinary medicine for the Society.

Dr. Schnelle joined the staff of the Angell Memorial Animal Hospital immediately after

receiving his V.M.D. degree and has served there continuously except when he was officer in charge of veterinary activities of the War Dog Reception and Training Center at Front Royal, Va., 1943-1945.

In addition to his hospital duties, Dr. Schnelle served as associate editor of the *North American*

Dr. Gerry B. Schnelle

Veterinarian from 1937 to 1945; edited the first edition of the "Index of Diagnosis" by Major Hamilton Kirk; was president of the Massachusetts Veterinary Association, and is now secretary of the Board of Registration of the State Association.

Dr. Schnelle is the present editor of *Veterinary Excerpts*, author of many articles on veterinary medicine and of a book "Radiology in Small Animal Practice" now in its second edition.

Michigan

Postgraduate Conference.—The twenty-eighth annual postgraduate conference for veterinarians at Michigan State College was held Jan. 24-25, 1951. The program follows. Speakers not otherwise identified are members of the faculty of the School of Veterinary Medicine, Michigan State College.

Dr. J. D. Ray, Corn States Serum Co., Omaha, Neb.: "Variant Hog Cholera Virus Problems."

Dr. R. G. Schirmer: "Intervertebral Disc Injuries."

Dr. E. P. Leonard, head, small animal clinic, New York State Veteriary College, Cornell University, Ithaca: "Complications of the Pregnant Bitch" and "Diaphragmatic Hernias and Perineal Hernias."

Dr. Don LeDuc (M.D.), Lansing practitioner and lecturer in surgery and medicine, Michigan State College: "External Fracture Fixation."

Dr. W. F. Riley: "Teat Surgery."

Dr. A. R. Drury: "Newer Antibiotics in Mastitis."

Dr. M. Bigelow, practitioner, Flushing: "Diagnosis of Traumatic Gastritis."

Dr. Howard Dunne: "Erysipelas in Turkeys, Swine, and Man."

Dr. Lee Davisson, state veterinarian: "Pros and Cons of Live Culture Erysipelas Vaccine in Michigan."

Mr. Robert Paige, consultant, Eastman Kodak Co.: "Problems of X-Ray Film Developing."

Dr. S. J. Roberts, large animal clinic, New York State veterinary College, Cornell University, Ithaca: "Sterility in Cattle" and "Report on Several New Products and Methods in Large Animal Practice."

Colonel W. O. Kester, V.C., USAF: "Veterinarians in the Veterinary Corps of the U.S. Army."

Dr. E. A. White was moderator of a panel discussion on "Cattle Practice." He was assisted by Drs. R. P. Azelton, practitioner, Mason; C. F. Clark; Paul Miller, practitioner, Grand Ledge; and Ed. Sterner, practitioner, Ionia.

The clinic program featured series of clinical cases representative of current practice problems and was presented by local veterinary organizations from different districts of the state.

s/G. R. MOORE, *Chairman, Conference Committee.*

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Southeastern Association.—At the business meeting of the Southeastern Michigan Veterinary Medical Association at the Herman Kiefer Hospital, Detroit, the following officers were elected: Drs. Ivan Wood, Mt. Clemens, president; J. P. McEvoy, Royal Oak, vice-president; S. Kelly, Detroit, secretary; and Don Francisco, Highland Park, treasurer. Dr. D. L. Caswell, Royal Oak, was elected to the Board of Directors.

s/S. KELLY, *Secretary.*

Minnesota

Dr. Pomeroy Honored.—Dr. B. S. Pomeroy, professor of veterinary medicine at the University of Minnesota, St. Paul, since 1934, has been awarded the National Turkey Federation's research award for 1950. The award, a plaque and $500 in cash, is given annually for outstanding service to the turkey industry through constructive research.

Dr. Pomeroy's chief poultry research work at the University has been the study of pullorum and paratyphoid infections and the use of

sulfonamide and other recent drugs. One of the most important pullorum problems he has worked on is the development of an improved test for detecting carriers in flocks.

Missouri

Kansas City Association.—The roster of elected officers for 1951 are Drs. W. H. Mowder, Independence, president; W. E. Dicks, Harrisonville, vice-president; K. M. Curts, Kansas City, secretary-treasurer. They were officially installed at a ceremonial banquet in Olathe, Kansas, January 30.

s/K. M. CURTS, *Secretary.*

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Kansas City Small Animal Hospital Association.—The Kansas City Small Animal Hospital Association met in the Hotel Continental on Jan. 8, 1951, for a scientific program including three medical films on the atomic bomb, presented by the Naval Air Station Film Library. The films were timely, as the Kansas City veterinary medical associations are included in the area medical defense plan.

s/T. M. EAGLE, *Secretary.*

Nebraska

State Association.—The fifty-fourth annual meeting of the Nebraska State Veterinary Medical Association was held in the Hotel Cornhusker, Lincoln, Dec. 4-7, 1950. The following scientific program was presented.

Dr. Joe Knappenberger, Ashe Lockhart Laboratories, Kansas City, Mo.: "Digestive Disorders of Cattle."

Dr. Herbert Shaefer (Ph.D.), Nutritional Research Laboratories, St. Louis, Mo.: "Outline on Nutrition."

Mr. L. E. Harris, director of research and control, Norden Laboratories, Lincoln: "New Developments of Chemotherapeutic Agents."

Dr. A. H. Quin, director, Professional Services Division, Jen-Sal Laboratories, Kansas City, Mo., conducted a swine and cattle forum, assisted by Drs. Norman Kruse, Genoa; L. I. Hines, Spencer; E. W. Peck, Auburn; Wm. Pitt, Broken Bow; C. B. Schwab, Fairbury; and O. L. Jenkins, Oshkosh.

Dr. J. E. Mosier, School of Veterinary Medicine, Kansas State College, Manhattan: "Problems of Small Animal Practice."

Colonel Oness H. Dixon, Jr., Headquarters Fifth Army, Chicago: "Army Veterinary Activities."

Mr. Wm. A. Albrecht, chairman, Department of Soils, University of Missouri, Columbia: "Soil Fertility Deficiencies and Possible Diseases."

Dr. C. H. Couvalt, Department of Veterinary Medicine, Iowa State College, Ames: "Bovine Sterility."

Officers elected for the ensuing year are Drs. O. E. Walgren, Platte Center, president; E. W. Peck, Auburn, vice-president; Ordella Geisler, Lincoln, secretary-treasurer.

s/PAUL L. MATTHEWS, *Resident Secretary.*

New Jersey

State Association.—The following scientific program was presented at the sixty-seventh annual meeting of the Veterinary Medical Association of New Jersey at the Hotel Hildebrecht in Trenton, Feb. 8-9, 1951.

Dr. Ellis P. Leonard, New York State Veterinary College, Cornell University, Ithaca, N. Y.: "Treatment of Conditions Associated with Pregnancy in the Dog" and "The Treatment of Long Bone Fractures."

Dr. William F. Riley, Jr., Michigan State College, East Lansing: "Surgical Shortcuts in Farm Practice" and "Artificial Bovine Insemination and the Michigan Practitioner."

Dr. Geoffrey W. Esty, director, Division of Constructive Health, State Department of Health, Trenton: "The Veterinarian's Part in the Civil Defense Program."

Dr. Frantisek Kral, University of Pennsylvania, Philadelphia: "Eczema, Dermatitis, and Otitis in Large and Small Animals."

Dr. G. H. Kimnach, Hightstown: "Corrective Surgery of the Udder."

Dr. J. C. Blumenthal, Princeton: "The Disposition of the Dog—Its Meaning in Training and Treatment" (with illustrations).

The following motion pictures were shown during the meeting: "Veterinary Public Relations and Economics" (courtesy Associated Serum Producers, Inc.) and "Outbreak—The Story of Foot-and-Mouth Disease" (courtesy U. S. BAI).

s/J. R. PORTEUS, *Secretary.*

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Canine Cancer Clinic.—Establishment in the Bureau of Biological Research of Rutgers University, New Brunswick, of a clinic devoted to the study and treatment of cancer in dogs has been announced by Dr. Robert C. Clothier, president of the State University of New Jersey. The clinic is believed to be the first of its kind in the nation.

Sponsored by the University and the U.S. Public Health Service, which has made $15,000 available for the first year, the clinic is endorsed by the Veterinary Medical Association of New Jersey. The Association has appointed the following advisory committee of its members to aid in the work: Drs. A. F. North, Somerville; Joseph Engle, Summit; J. A. Millar, Deal; E. Fooder, Haddonfield; and M. L. Morris, Stelton.

The clinic is under the supervision of a veterinarian, Dr. John H. McCoy (UP '40), formerly of Trenton, associate research specialist in the Bureau of Biological Research,

and Dr. James B. Allison, director of the Bureau.

The Rutgers clinic will diagnose, study, and treat cancer in dogs, the incidence of which is about the same as that in man—5 per cent. The handling of the dogs referred to the clinic will approximate the treatment given a human being in one of the major cancer clinics.

Treatment methods will place particular emphasis on chemotherapeutic agents including such compounds as triethylenimino-s-triazine which has been found to be particularly effective in causing regression of certain cancerous growths in dogs. Surgery will also be used where indicated, according to Dr. Allison.

Dr. McCoy explained that dog patients referred to the clinic by veterinarians will be given free treatment. For the most part, the diseased animals will be treated at the clinic on the campus, but in some instances, treatment will be conducted at animal hospitals under supervision of clinic specialists.

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Dr. Jenne To Act as Consultant to Government.—Dr. Herbert J. Jenne, who has been associated with the New Jersey Division of Animal Industry as chief of the Bureau of Brucellosis Control, has been granted a year's leave of absence to act as a veterinary consultant to the federal government on problems of national security. During the next year, Dr. Jenne will be in Washington, D.C.

s/J. R. PORTEUS, *Resident Secretary.*

New York

Western Association.—When the Western New York Veterinary Medical Association met in Buffalo on Dec. 14, 1950, the following program was presented.

Dr. H. H. Hodges, Ithaca: "Pen Stabling and Mastitis Control."

Dr. H. E. Jensen, Cleveland, Ohio: "Clinical Aspects of Small Animal Medicine" (with illustrations).

Colonel Wm. E. Jennings, Ithaca: "Visual and Pathologic Effects of Atomic Radiation of Animals."

Officers elected at this meeting are Drs. A. M. Rindell, Rochester, president; W. L. Weitz, Snyder, vice-president; F. F. Fehr, Buffalo, secretary-treasurer. Drs. D. D. Ford, Niagara Falls, and G. V. McKinney, Spencerport, were elected censors for a three-year period.

s/F. F. FEHR, *Secretary.*

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New York City Association.—The regular meeting of the Veterinary Medical Association of New York City, Inc., was held at the Hotel Statler on Jan. 3, 1951.

Dr. Albert Earl, research veterinarian, Ciba Pharmaceutical Products, Inc., Summit, N. J., presented a paper on "The Pharmacology of Respiratory Stimulants with Special Reference to Coramine." The paper was illustrated by motion pictures.

s/C. R. SCHROEDER, *Secretary.*

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Physiology Course for Teachers.—The second refresher course of lectures and demonstrations in physiology for teachers in this subject and pharmacology were conducted at the New York State Veterinary College at Cornell University Aug. 7 through 18, 1950.

Dr. H. H. Dukes conducted the conference and he and his assistants gave demonstrations of the teaching aids which he has developed and which are used regularly in teaching his students. More than 20 persons, representing practically every department of physiology and pharmacology at each of the colleges of veterinary medicine, was represented. The group was enthusiastic and all participated in manning the demonstrations.

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Dr. Birch Studying in Europe.—Dr. R. R. Birch, emeritus professor of veterinary medicine, New York State Veterinary College, Cornell University, Ithaca, is studying animal diseases in European countries under the sponsorship of the Marshall Plan (ECA). Dr. Birch has been a lifelong student of brucellosis.

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Longevity of Bacillus Anthracis.—Hansen (*Vet. News*, Dec., 1950) reports a case of anthrax in a cow which appeared to have been caused by exposure to the skeleton of a cow that died from an unknown disease twenty-two years ago. Though the author does not contend that the source of the infection was confirmed beyond doubt, the fact that anthrax has occurred at long intervals in the region for many years, and that the longevity of *Bacillus anthracis* in pasture is well known, tend to confirm the doctor's suspicion.

Ohio

State Association.—The sixty-seventh annual meeting of the Ohio State Veterinary Medical Association was held in the Deshler-Wallick Hotel, Columbus, on Jan. 3-5, 1951, with 401 veterinarians and 200 students from The Ohio State University College of Veterinary Medicine in attendance. The following scientific program was presented.

Dr. F. T. Candlin, practitioner, Denver, Colo.: "The Value of an Autopsy."

Dr. F. J. Kingma, The Ohio State University: "A Technique for the Slow Infusion of Parenteral Fluids" (with illustrations).

Dr. J. E. Patterson, practitioner, Detroit, Mich.: "Practitioner-Client Relationship in Feline Practice."

Drs. C. S. Alvanos, Toledo; R. L. McClarren, Columbus; F. T. Candlin; and J. E. Patterson: "Tricks of the Trade." This portion of the program consisted of five- to ten-minute presentations of some aspect of practice,

and any member of the audience was permitted to participate in the discussion.

Dr. R. D. Little, Jeffersonville: "Differential Diagnosis of Swine Diseases" (with illustrations).

Drs. H. G. Geyer, chief, Division of Animal Industry, Columbus; R. L. Knudson, veterinarian in charge, U. S. BAI, Columbus; J. A. McCoy, practitioner, Washington, C. H.; G. W. Lies, practitioner, Fort Recovery; J. T. Burriss, Columbus Serum Company, Columbus: "Difficulties Encountered in Connection with Hog Cholera Immunization."

Dr. D. L. Proctor, practitioner, Lexington, Ky.: "Diagnosis and Treatment of Sterility in the Mare."

Dr. W. L. Ingalls, Poultry Diagnostic Laboratory, The Ohio State University, was moderator of a panel discussion on "How I conduct my Poultry Practice." Panel members were Drs. E. S. Weisner, Goshen, Ind.; R. L. Bay, Delta; W. L. Lukens, Hillsboro; and W. J. Barga, Versailles.

Dr. W. R. Krill, dean, College of Veterinary Medicine, Columbus: "Ohio Practitioner Interest in Poultry Practice—Report of a Survey."

Dr. W. L. Slatter, Department of Dairy Technology, The Ohio State University: "Why is the Dairy Industry Interested in the Use of Antibiotics in Mastitis."

Dr. C. D. Van Houweling, Chicago, assistant executive secretary of the AVMA: "The Role of the Veterinarian in a National Emergency."

Dr. N. B. King, Animal Disease Laboratories, Reynoldsburg: "The Capillary Tube Test: A New Method for Diagnosing Brucellosis."

Dr. J. F. Knappenberger, Ashe Lockhart, Inc., Kansas City, Mo.: "Digestive Tract Disturbances in Cattle."

Dr. W. R. Haubrich, practitioner, Claremont, N. H.: "Bovine Sterility—Possible Causes and Treatment."

Dr. T. J. Jones, dean, School of Veterinary Medicine, the University of Georgia, Athens: "Farm Animal Nutrition."

The committee appointed to consider the advisability of using laymen as bleeders in the brucellosis control program presented a plan whereby such employees would be under the direct supervision of either the Ohio Division of Animal Industry or the U.S. Bureau of Animal Industry and, more specifically, under the immediate supervision of a veterinarian from either of these offices. The use of lay personnel would be utilized only in those counties where area brucellosis programs are in progress and only when practicing veterinarians are unable to complete the work satisfactorily in the specified time.

A new executive committee was established which will include, in addition to the officers of the state Association, nine veterinarians, each representing a geographical section of the state. These districts are divided according to veterinary population and geographical location. This plan is to enable the Association to have a more thorough representative governing committee.

New officers of the Association are Drs. S. W. Stout, Harrison, president; J. T. Burriss, Columbus, president-elect; Wesley Keefer, Springfield, vice-president; Fred Kingma, Columbus, secretary; John Helwig, Columbus, treasurer.

The Committee on Local Arrangements, largely responsible for the success of the meeting, included Drs. H. M. Mauger, H. G. Geyer, R. D. Jones, V. L. Tharp, L. C. Ferguson, and their wives.

s/CHARLES DIESEM, *Resident Secretary.*

Oklahoma

State Association.—The thirty-sixth annual meeting of the Oklahoma Veterinary Medical Association was held at the Skirvin Tower Hotel, Oklahoma City, Jan. 8-9, 1951. The following scientific program was presented.

Dr. W. M. Coffee, LaCenter, Ky., president of the AVMA: "General Practice" (with illustrations) and "Activities of the American Veterinary Medical Association."

Dr. M. A. Emmerson, professor and head, Department of Veterinary Obstetrics, Iowa State College, Ames: "X-Ray Therapy of Some Common Animal Diseases" and "The Practical Handling of Bovine Sterility" (both illustrated).

Dr. W. G. Magrane, practitioner, Mishawaka, Ind.: "Basic Canine Ophthalmology" and "Advanced Canine Ophthalmology" (both illustrated).

Dr. C. C. Morrill, Department of Pathology, University of Illinois, Urbana: "Nervous Disturbances in Cattle and Swine" and "Some Poisonings in Cattle and Swine."

Officers elected at the business session are Drs. W. S. Mason, Clinton, president; W. D. Bowerman, Oklahoma City, vice-president; Lewis H. Moe, Stillwater, secretary-treasurer.

s/O. E. ROBINSON, *Resident Secretary.*

Ontario

Provincial Association.—The program of the seventy-seventh annual meeting of the Ontario Veterinary Association, held Jan. 10-12, 1951, at the Royal York Hotel, Toronto, is presented here.

Dr. W. J. Stinson, practitioner, Perth: "Postparturient Problems in Dairy Cattle." Dr. Frank Codlin, practitioner, Lindsay, led the ensuing discussion.

Dr. Frank Rushton, public health veterinarian, Department of Health, Toronto: "The Public Health Veterinarian in Relation to Milk Production." The discussion was led by Dr.

J. C. C. Gandier, supervisor of food control, Welland and District Health Unit, Welland.

Dr. R. G. Knox, head, Department of Animal Husbandry, Ontario Agricultural College, Guelph: "The Relationship Between Show Ring Standards and Commercial Livestock." Dr. James Pinkney, practitioner, Cooksville, led the discussion.

Dr. E. B. Powell (Ph.D.), director of research, Ralston Purina Company, St. Louis, Mo.: "Some of Our Mutual Problems in Serving Agriculture." The discussion was led by Dr. R. A. McIntosh, head, Department of Medicine, Ontario Veterinary College.

Dr. A. A. Winston, head, Processing Technology Section, Central Laboratories, General Foods Corp., Hoboken, N.J.: "Guide to Small Animal Nutrition." The discussion of this paper was led by Dr. R. W. Ford, practitioner, Peterborough, Ont.

Dr. R. C. Klussendorf, Chicago, Ill., editor-in-chief of AVMA publications: "What is New in Veterinary Medicine." Dr. C. A. Mitchell, chief, Division of Animal Pathology, Science Service, Dominion Department of Agriculture, Hull, P.Q., also discussed this subject.

Dr. F. C. Tucker, practitioner, Claypool, Ind.: "Development of a Poultry Practice." Dr. Ronald Gwatkin, Division of Animal Pathology, Science Service, Dominion Department of Agriculture, Hull, P.Q., led the discussion.

Dr. S. F. Scheidy, veterinary medical director, Medical Research Division, Sharpe and Dohme, Inc., Glenolden, Pa.: "Antibiotic Therapy in Veterinary Medicine." Dr. D. A. Barnum, bacteriologist, Ontario Veterinary College, Guelph, led the discussion.

Dr. Frank Thorp, Jr., School of Veterinary Medicine, Michigan State College, East Lansing: "Nutrition in Relation to Swine Diseases." Dr. L. C. Swan, practitioner, St. Catharines, Ont., discussed this paper.

Dr. W. J. Rumney, practitioner, Aldershot, Ont.: "Skin Conditions in Dogs." Dr. A. F. MacKinnon, Practitioner, Galt, Ont., also discussed this subject.

s/G. A. EDGE, *Secretary.*

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Dr. Schofield Honored.—Dr. Frank W. Schofield (ONT '10), head of the Department of Pathology at the Ontario Veterinary College, Guelph, has been nominated an honorary doctor of the veterinary faculty of the Ludwig Maximilian University in Munich, Germany, in recognition of his outstanding contributions to science.

s/T. L. JONES, *Resident Secretary.*

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Ontario Veterinary College, 1949 Report.—"What's doing" in education at the pioneer veterinary college in this Hemisphere is documented in an illustrated booklet of 145 pages addressed to the provincial Minister of Agriculture, over the signature of Principal A. L. MacNabb. The text not only gives the salient points about each of the nine scholastic departments but also enriches the literature with illustrated articles on the current investigational work carried out by the tutorial staff. Notable among these are reports of original research on enterohepatitis of turkeys, fascioliasis of cattle and sheep, streptomycin therapy, critical studies of a case of ectopia cordis (bovine) and of a perosomus foal, Marie's disease in a dog, and other significant material. The latter includes work by Rumney and Schofield that appears to be the most complete investigation of pulmonary hypertropic osteo-arthropathy published in English veterinary literature.

Pennsylvania

Conference for Veterinarians.—The fifty-first annual conference of veterinarians sponsored by the School of Veterinary Medicine, University of Pennsylvania, was held Jan. 2-3, 1951, with a registration of 263. The scientific program follows.

Dr. Guy M. Graybill, chief, Miscellaneous Disease Division, Bureau of Animal Industry, Harrisburg: "Highlights of the Brucellosis Control Program in Pennsylvania."

Dr. F. D. W. Lukens (M.D.), director, the George S. Cox Medical Research Institute, University of Pennsylvania Medical School: "Cortisone and ACTH."

Dr. R. C. Klussendorf, Chicago, editor-in-chief of AVMA publications: "Progress in Veterinary Medicine" and "Developments in Nutrition."

Dr. A. L. Brueckner, director, Livestock Sanitary Service Laboratory, Maryland State Department of Agriculture, College Park: "A Report of the West Virginia Experiment with Mucoid Brucella Vaccine (Huddleson)."

Dr. S. H. McNutt, Department of Veterinary Science, University of Wisconsin, Madison: "Nervous Diseases of Large Animals."

Dr. F. R. Beaudette, professor of poultry pathology, Rutgers University, New Brunswick, N. J.: "The Differentiation of Virus Diseases in Poultry."

Dr. H. A. Milo, chief, Tuberculosis Eradication Division, Bureau of Animal Industry, Harrisburg: "Highlights of Bovine Tuberculosis Eradication Work in Pennsylvania."

Dr. Robert J. Huebner (M.D.), in charge, Research Unit and of Q Fever Laboratory, National Institutes of Health, U. S. Public Health Service, Bethesda, Md.: "Q Fever."

Dr. Hilary Koprowski (M.D.), assistant director, Viral and Rickettsial Research Department, Lederle Laboratories, Pearl River, N. Y.: "Rabies."

Dr. W. N. Plastridge (Ph.D.), Department

of Animal Diseases, University of Connecticut, Storrs: "Vibriosis in Cattle."

Dean Raymond A. Kelser, University of Pennsylvania School of Veterinary Medicine: "Diseases of Animals Important in Time of War."

Dr. Jacques Jenny, assistant professor of veterinary surgery, University of Pennsylvania School of Veterinary Medicine: "Fracture Treatment in Daily Practice."

s/Donald G. Lee, *Resident Secretary.*

• • •

Keystone Association.—The Jan. 24, 1951, meeting of the Keystone Veterinary Medical Association was held in the University Room of the Penn Sheraton Hotel, Philadelphia. Dr. William D. Pounden, Animal Disease Research Station, Beltsville, Md., discussed "Cattle Nutrition, Young and Old."

s/Raymond C. Snyder, *Secretary.*

Tennessee

State Association.—On Jan. 14-16, 1951, the Tennessee Veterinary Medical Association met at the Maxwell House in Nashville. Speakers and their subjects on the program were:

Dr. C. E. Kord, state veterinarian, Nashville: "The Activities of the Practicing Veterinarians in the Division of Animal Disease Control."

Dr. Dennis Sikes, University of Tennessee, Knoxville: "Progress Report of Veterinary Activities at the University of Tennessee."

Dr. W. R. Lawrence, practitioner, Dyersburg: "Common Diseases and Problems of Handling Hogs."

Dr. E. F. Thomas, University of Georgia, Athens: "Poisoning in Livestock" and "Poultry in the General Practice of Veterinary Medicine."

Dr. W. M. Coffee, LaCenter, Ky., president of the AVMA: "General Practice" (with illustrations) and "The American Veterinary Medical Association."

Dr. Ralph Ruggles, practitioner, Moline, Ill.: "Small Animal Practice" and "Practical Suggestions for Your Hospital."

Dr. Virgil Robinson, Vanderbilt University, Nashville: "Histoplasmosis in Animals."

Colonel James R. Sperry, V. C., U. S. Army, Fort McPhearson, Ga.: "The Veterinarian in the Army."

Dean R. S. Sugg, College of Veterinary Medicine, Auburn, Ala.: "Veterinary Education in the Southeast."

The meeting was well attended and listeners were enthusiastic about the program. Twenty-nine new members joined the Association, the most that have joined at any time in its history. This leaves only 24 veterinarians in the state who are not members of the Association.

Officers elected at this meeting are Drs. Fred Schell, Franklin, president; Kenneth Whittington, Memphis, president-elect; R. A. Gathman, Franklin, first vice-president; H. E. Hill, Maryville, second vice-president; B. E. Foote, Memphis, third vice-president; H. W. Hayes, Knoxville, secretary-treasurer. Dr. W. R. Lawrence, Dyersburg, was elected delegate to the AVMA House of Representatives, and Dr. H. W. Nance, Lawrenceburg, was elected as alternate.

s/H. W. Nance, *Secretary.*
s/Dennis Coughlin, *Resident Secretary.*

Washington

Public Health Committee Formed.—At a recent meeting, the Washington State Veterinary Medical Association formed a public health committee for the purpose of coöperating in planning and initiating veterinary aspects of programs directed at preventing transmission of animal diseases to man. The committee consists of Drs. J. C. Kraft, Seattle; R. H. Bradbury, Mount Vernon; D. E. Ferguson, Pasco; R. R. Weller, Tacoma; and Myles Van Hoosen, Pullman, who will work through Dr. M. A. Holmes, veterinary public health consultant of the State Department of Health.

Such programs as develop will be in coöperation with the State Department of Agriculture, School of Veterinary Medicine of Washington State College, private veterinarians, and other related agencies.

s/J. A. Kahl, *M.D., Acting Director, State Department of Health.*

Wisconsin

State Association.—The following scientific program was presented at the thirty-fifth annual meeting of the Wisconsin Veterinary Medical Association in the Schroeder Hotel, Milwaukee, Jan. 9-11, 1951.

Dr. Lloyd C. Ferguson, associate professor of bacteriology, The Ohio State University, Columbus: "Some Applications of Blood Typing in Cattle" and "Leptospirosis in the Domestic Animal."

Dean Walter R. Krill, College of Veterinary Medicine, The Ohio State University, Columbus: "Embryotomy in Veterinary Obstetrics."

Drs. W. R. Winner, veterinarian in charge, U. S. Department of Agriculture; and H. J. O'Connell, acting chief, Division of Livestock Sanitation, Department of Agriculture, Madison: "Animal Disease Control Programs in Wisconsin."

Dr. F. W. Milke, Milwaukee, was moderator of a panel discussion on "Small Animal Practice." Other panel members were Drs. P. C. Candlin, Madison; C. B. Krone, LaGrange, Ill.; C. H. Reading, Madison; G. Lewis, Menomonee Falls.

Dr. W. L. Roberts (Ph.D.), Federal Foods, Inc., Thiensville: "Nutritional Relationships of Foxes, Dogs, Ferrets, and Mink."

Dr. W. O. Brinker, professor of surgery

and medicine, Michigan State College, East Lansing: "Canine Fracture Problems."

Dr. M. Shiffman, Milwaukee Health Department: "The Mutual Goals of the Practitioner and Milk Sanitarian."

Dr. George T. Edds, director, Pharmacological Research, Fort Dodge Laboratories, Fort Dodge, Iowa: "Practical Application of Recent Nutritional Developments."

Dr. R. B. Hipenbecker, Fennimore, was toastmaster at the banquet. Guest Speaker Walter R. Krill discussed "Planning for the Proper Utilization of Veterinarians in an Emergency."

Officers elected for the ensuing year are Drs. John T. Schwab, Madison, president; M. W. Downing, Waukesha, vice-president; W. L. Richards, Morrisonville, reëlected treasurer; and B. A. Beach, Madison, reëlected secretary.

s/B. A. BEACH, *Secretary.*

FOREIGN NEWS

Africa

Tuberculosis in Cattle.—A two-and-one-half-year investigation into the incidence of tuberculosis in cattle in certain parts of Tanganyika is being carried out by the East African Veterinary Research Organization which serves the four British East African Territories of Kenya, Uganda, Tanganyika, and Zanzibar.

The investigation was undertaken at the request of the Tanganyika Veterinary Department because the incidence of the disease has been increasing during the past few years.

Mr. A. E. G. Markham, who is in charge of the work, is assisted by European and African veterinary experts. A caravan, fitted with all the necessary equipment for bacteriologic investigations, constitutes the main laboratory. Office and living accommodations are provided in another caravan. This arrangement enables the team to move from place to place without any dislocation of work.—*Indian Farming, March, 1950.*

Algeria

Center of Medical Research.—The regular reports of the Institut Pasteur d'Algerie, among other things, are never-failing accounts of tropical veterinary medicine. Since Laveran, in 1880, revealed the specific agent—*Plasmodium malariae*—of quartan malaria, this French colony has had a prominent place on the "scientific map," through daring researches on human and animal diseases. Though paludism *per se* is of little importance in farm animals, veterinary medicine obtained a towering return from Laveran's discovery. It led headlong to the discovery of true vectors—to the Piroplasma-bearing tick of Texas fever by Smith, Kilborne, and Curtice in the United States in 1893, the Plasmodium-bearing mosquito of malaria in British India in 1898 by Sir Roland Ross, and the virus-bearing mosquito of yellow fever in 1899 by Walter Reed of the U.S. Army.

The extent to which the wealth of this civilization has been augmented by these discoveries is too well known to recount here.

France

Foot-and-Mouth Disease.—The outbreak of foot-and-mouth disease in Mexico and the magnitude of the four-year battle waged against it by the two countries involved, together with its constancy in the principal livestock regions of Europe, makes that elusive infection the gravest threat to animal production at the present time. To meet the challenge, L'Office International des Epizoöties created a permanent commission for the study of the technical problems imposed. The personnel of the important commission are: Wagoner (Germany); Willems (Belgium); Schmidt, Fogedby, and Hansen (Denmark); Megias (Spain); Thiéry, Girard, and Mérieux (France); Altara, Calisti, Menzani, Mirri, Mura, Rosati, Serra, Ubertini, and Zavagli (Italy); Vaysse (Morocco); Frenkel (Holland); Fluckiger and Moosbrugger (Switzerland); and Osteen (United States). The problems of vaccination were set apart for particular attention. The first session of the commission was held in Paris May 13-16, 1950. Current knowledge of foot-and-mouth disease vaccination, brought forth in the discussions, is published in *Bulletin de l'Office International des Epizoöties,* September-October, 1950. The address is 12 Rue de Prony, Paris 17, France.

Germany

Enrich the Literature.—Whatever may be thought about Germany's shattered politics, the fact remains that her foremost veterinarians continue to carry on. A treatise on obstetrics that rates far above the average of our day on that subject has recently been published. The senior editor is the late Prof. J. Richter (he died before the book was published) of the veterinary school of Leipzig and the junior editor is Prof. R. Götze of the Hanover school. These scientists obtained the collaboration of Benesch of Vienna, Van der Kaay of Utrecht, Lagerlöf of Stockholm, Liesse of Denmark, Rosenberger of Sarstert (Germany), and thus set a fine example of international cooperation that ought to be imitated by the authors of our small (veterinary) world.

Obviously, this book is the most profound anthology on obstetrics ever written, backed as it is by a selected authorship. Its parts were assigned to experienced authorities on the particular subject, and the ensemble is an expression of their deep faith in, and devotion to, the majestic task.—[*Tiergeburtshilfe. By J. Richter and R. Götze. 700 pages. 465 illustrations. Paper and typography (in German) outstanding. Schoetz, Berlin. 1950. Price $11.50 (est.).*]

Great Britain

War Dogs.—Of the various demonstrations of the Royal Army engineers, the correspondent of *The Times* wrote: "Most of the displays were impressive, some were almost awe-inspiring, but none interested the spectators more than mine detection by some assorted dogs. We saw the dummy mines buried and later saw dogs come along, wearing ordinary dog harness held by their handlers, and walk eagerly over the mine field. Now and then one would sit down abruptly. A sapper, who had followed, placed a marker between the dog's forepaws and, when the dog was led away, grubbed with hands under the marker and produced the mine (a bottle or tin can). No one yet seems to know what canine sense comes into play in this unerring detection of a buried object, nor is the sense peculiar to any particular breed, though the dogs that are quickest at it appear to have a retriever strain somewhere in their ancestry. Long experience in finding buried bones may have something to do with the matter. The 2 dogs we saw at work today were said to have been taken from a home for strays." —*From The Veterinary Record, June 17, 1950.*

Italy

Auspicious Departure.—*Archivio Veterinario Italiano* spreads its information and influence over the world by publishing comprehensive summaries of its articles and abstracts in French, English, German, and Italian. It is assumed that were this thoughtful idea universally practiced in all countries, the interchange of knowledge among the world's doctors of veterinary medicine would be more rapid and complete.

Philippine Islands

The College of Veterinary Medicine.—In 1909, the University of the Philippines opened its College of Veterinary Medicine in Pandacan, Manila, and the following year enrolled the first students who graduated four years later in what was then a novel course in the country.

During its forty years of existence, the College has moved from one place to another, at one time staying in Los Baños for fourteen years, and finally settling at its present site in Diliman. In coöperation with other government institutions, it has controlled outbreaks of animal epizoötics in the country, and has promoted the hygienic handling of meat for human consumption. In Diliman, it is carrying on a community campaign to register all dogs and household pets and vaccinate them regularly against rabies. It also plans to establish and supervise a slaughterhouse on the campus, so that meat consumed in the University area may be safeguarded against contamination.

With an average of less than 100 students, the College has maintained a high plane of academic and practical training. Many of its graduates are from neighboring Siam, Indonesia, and India.—*U.P. Bulletin.*

BIRTHS

Dr. (KSC '44) and Mrs. Leo Garvert, Springfield, Ill., announce the birth of a daughter.

Dr. (UP '40) and Mrs. Clyde I. Boyer, Jr., Tifton, Ga., announce the birth of a daughter, Sandra Lee, Oct. 9, 1950.

Dr. (ISC '49) and Mrs. L. E. Witt, Sidney, Mont., announce the birth of a daughter, Ellen Jane, Nov. 14, 1950.

Dr. (COL '41) and Mrs. Leon F. Ackermann, Bakersfield, Calif., announce the birth of a daughter, Margaret, Nov. 17, 1950.

Dr. (ISC '43) and Mrs. L. E. Fisher, Berwyn, Ill., announce the birth of a daughter, Jane, on Nov. 27, 1950.

Mr. and Mrs. (Dr. Jean Reindel Hagan, MSC '38) Bruce D. Hagan, Adams, N.Y., announce the birth of a daughter, Patricia Rae, Dec. 21, 1950.

Dr. (UP '36) and Mrs. Sperry C. Kinton, Lebanon, N.J., announce the birth of a son, James Clark, on Dec. 27, 1950.

Captain (MSC '44) and Mrs. John S. Zwiers, Oak Park, Ill., announce the birth of a daughter, Karen, on Dec. 27, 1950.

Dr. (COL '42) and Mrs. Paul R. Lanphear, Quincy, Ill., announce the birth of a son, John Paul, on Dec. 28, 1950.

Dr. (UP '47) and Mrs. Russell A. Nelson, Pleasanton, Calif., announce the birth of their second son, Bruce Allen, on Jan. 4, 1951.

DEATHS

★**J. R. Beach** (COR '13), 62, Davis, Calif., died Jan. 4, 1951. An obituary appears on page 187 of this JOURNAL. Dr. Beach was a member of the AVMA.

David S. Beardsley (OSU '43), 32, Ashtabula, Ohio, died in 1950. Dr. Beardsley had been a member of the AVMA.

McKeen Boyce (IND '10), Vanport, Pa., died Dec. 2, 1950. Dr. Boyce had been a member of the AVMA.

★**John W. Caldwell** (SF '15), 69, Riverside, Calif., died Nov. 29, 1950. Dr. Caldwell was a member of the California State, Southern California, and Orange Belt Veterinary Medical Associations, and of the AVMA.

★**David F. Deming** (COR '14), 65, Massena, N.Y., died July 30, 1950. Dr. Deming was a member of the New York State and Northern New York Veterinary Medical Associations. He was president of the latter association in 1937-1938. Dr. Deming was admitted to the AVMA in 1923.

★Indicates members of the AVMA.

Paul T. Dempsey (CVC '17), 65, Sandstone, Minn., died Aug. 23, 1950. Dr. Dempsey had been in ill health for some time.

Milo C. Eckley (CVC '93), Galesburg, Ill., died Nov. 10, 1950. Dr. Eckley had retired some time ago.

William L. Endsley (KCVC '10), 76, Fort Worth, Texas, died March 8, 1950. Dr. Endsley was employed by the U.S. Bureau of Animal Industry. He had been a member of the AVMA.

★**Lynn B. Fake** (UP '39; COR '40), 33, Bay Shore, Long Island, N.Y., died in 1950. Dr. Fake was admitted to the AVMA in 1940.

Lewis E. Frank (CVC '12), Hancock, Minn., died some time ago. He had retired from active practice.

Frederick W. Godsall (CVC '02), 78, Kewanee, Ill., died Nov. 10, 1950. Dr. Godsall started practicing in Kewanee in 1905 and, with the exception of seven years when he was employed as state agent of the Bureau of Animal Industry at the National Stock Yards in East St. Louis, he had practiced continuously in Kewanee until his health failed.

★**Henry Gordon** (NYS '18), 63, New York, N.Y., died in 1950. Dr. Gordon was a member of the New York State Veterinary Medical Society and of the AVMA.

R. C. Lovesee (ISC '11), Sauk Centre, Minn., died recently. Dr. Lovesee was field veterinarian of the Minnesota Livestock Sanitary Board for twenty years. He retired in July, 1950.

James McDonald (MCK '08), Denver, Colo., died Jan. 31, 1950. Dr. McDonald was employed by the U.S. Bureau of Animal Industry.

★**Fred D. Markham** (CVC '95), 76, Port Leyden, N.Y., died Oct. 27, 1947. Dr. Markham was admitted to the AVMA in 1935.

★**George O. Miller** (OSU '10), 69, Kenton, Ohio, died in August, 1950. Dr. Miller was a member of the Ohio State and Northwestern Ohio Veterinary Medical Associations, and of the AVMA.

★**Earl S. Mohr** (IND '14), 58, Jackson, Miss., died on Oct. 21, 1950. Dr. Mohr was in the employ of the U.S. Bureau of Animal Industry at the time of his death. He was admitted to the AVMA in 1927.

Ross Moorman (KCVC '17), Sterling, Colo., died July 2, 1950.

L. C. Morgan (OSU '20), Indianapolis, Ind., died in August, 1950. Dr. Morgan was a member of the AVMA from 1926 to 1943.

Edward H. Morris (MCG '96), Derby, Conn., died in 1949. Dr. Morris was a large animal practitioner. He was a member of the Connecticut Veterinary Medical Association.

John A. Rooney (MCK '20), Joliet, Ill., died Sept. 18, 1950. Dr. Rooney was a practitioner.

★**C. R. Sandburg** (KCVC '16), 63, Zumbrota, Minn., died Dec. 27, 1950. Dr. Sandberg was admitted to the AVMA in 1924.

Rokus Schaap (CVC '13), 60, Battle Lake, Minn., died recently. Dr. Schaap had been a member of the AVMA.

Sydney S. Wertz (CVC '09), 69, Kenesaw, Neb., died Aug. 22, 1950. Dr. Wertz was a general practitioner. He is survived by his widow, Mrs. Nellie M. Wertz.

★**H. S. Widney** (TEX '37), 59, Houston, Texas, died Sept. 18, 1950, of a heart attack. Dr. Widney was a member of the Dallas County Veterinary Medical Association and of the AVMA. He is survived by his widow, Mrs. Aileen Ketcham Widney.

Deaths Not Previously Reported

The following is a list of veterinarians reported to the AVMA central office as deceased, by federal veterinarians in charge in the respective states, in the process of checking listings for the directory department. These deaths have not been reported previously in the JOURNAL.

W. D. Boulton, Braymer, Mo.
James H. Boyd, Clayton, Mich.
Newton W. Bradley, Ethel, Mo.
Charlemagne Bricault, Haverhill, Mass.
Horace M. Britt, LaHarpe, Ill.
E. N. Brown, Nashville, Tenn.
Joseph Butters, Willman, Minn.
Daniel J. Bynacker, Jackson, Miss.
J. F. Carr, Muskegan, Mich.
Howard A. Chapin, Grandville, Mich.
Raymond D. Colver, Mishawaka, Ind.
George J. Davis, Vermontville, Mich.
Joseph W. Ellis, Carthage, Miss.
Samuel Q. Fowle, Needham, Mass.
E. J. Hart, Pontiac, Ill.
Homer F. Hook, Statesboro, Ga.
Herbert Hoopes, Bel Air, Md.
M. P. Hunt, Lansing, Mich.
Alfred A. Johnson, Biloxi, Miss.
Harold F. Ketcham, Miami, Okla.
Charles H. Lockwood, Washington, D.C.
Jim H. McClung, Buena Vista, Ga.
Joseph E. May, Youkon, Okla.
Stephen T. Miller, Wenatchee, Wash.
Hubert O. Moore, Hattiesburg, Miss.
Edwin P. Niles, West Plains, Mo.
Newton M. Parker, Jackson, Miss.
Robert Prior, Seattle, Wash.
Howard A. Roscoe, Oklahoma City, Okla.
Walter J. Schimmel, Gainesville, Ga.
Alexander G. Smith, Portland, Ore.
Lewis C. Weeks, Falmouth, Mass.
Oscar F. West, Sheldon, Ill.
Mark D. Williams, Tarpon Springs, Fla.
Eddie P. Yager, Baltimore, Md.
Frank H. Zimmerman, Effingham, Ill.

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An'Related Topics

WATCH YOUR ENGLISH AND OURS

Abbreviations (*Continued*)

1) *Months of the Calendar Year.*—The AVMA does not approve the abbreviation of March, April, May, June, and July unless absolutely necessary in tabulated material, nor of any month of an incomplete date. One should write: January, 1951, and Jan. 1, 1951, the latter being a completed date. Oct., 1950, Apr., 1949, etc., is faulty usage, unless used in parentheses. When the full date is used, write:

Jan.	May	Sept.
Feb.	June	Oct.
March	July	Nov.
April	Aug.	Dec.

2) *Political Divisions.*—The political divisions of countries: states, provinces, districts, republics, departments, fylkers, läns, cantons, boroughs, *et al.*, except for the United States and Canada, are not abbreviated in English veterinary medical literature. That is, the republics of Russia and Germany, the Cantons of Switzerland, the departments of France, the läns of Sweden, and fylkers of Norway, etc., are always written out in AVMA publications. Not so, however, for the provinces of Canada and the states of the United States. The following are the orthodox abbreviations for these divisions of the United States:

Alaska	Kan.	N. M.
Ala.	Ky.	N. Y.
Ariz.	La.	N. Car.
Ark.	Maine	N. Dak.
Calif.	Md.	Ohio
Colo.	Mass.	Okla.
Conn.	Mich.	Ore.
Del.	Minn.	Pa.
D. C.	Miss.	R. I.
Fla.	Mo.	S. Car.
Ga.	Mont.	S. Dak.
Idaho	Neb.	Tenn.
Ill.	Nev.	T. H.
Ind.	N. H.	Texas
Iowa	N. J.	Utah

(*Continued on p. 28*)

COMING MEETINGS

Notices of Coming Meetings must be received by 4th of month preceding date of issue

Massachusetts Veterinary Association. Monthly meeting. Hotel Beaconsfield, Brookline, Mass., March 28, 1951. C. Lawrence Blakely, 180 Longwood Ave., Boston 15, Mass., secretary.

Animal Disease Research Workers in the Southern States. Annual meeting. School of Veterinary Medicine, University of Georgia, Athens, Ga., April 3-4, 1951. W. B. Bell, Virginia Agricultural Experiment Station, Blacksburg, Va., secretary.

Northern Illinois Veterinary Medical Association. Spring meeting. Faust Hotel, Rockford, Ill., April 11, 1951. Dale R. Stephenson, 2338 Charles St., Rockford, Ill., secretary.

North Central Iowa Veterinary Medical Association. Spring meeting. Warden Hotel, Fort Dodge, Iowa, April 19, 1951. B. J. Gray, Box 797, Fort Dodge, Iowa, secretary.

American Animal Hospital Association. Annual meeting. Chalfonte-Haddon Hall, Atlantic City, N. J., May 2-5, 1951. Wayne Riser, 5335 Touhy Ave., Skokie, Ill., secretary.

Texas Veterinary Conference. School of Veterinary Medicine, A. & M. College of Texas, College Station, Texas, June 7-8, 1951. R. D. Turk, chairman, conference committee.

North Carolina State Veterinary Medical Association. Annual meeting. Hendersonville, N. Car., June 8-9, 1951. J. H. Brown, Tarboro, N. Car., secretary.

American Society for the Study of Sterility. Annual meeting. Ritz-Carlton Hotel, Atlantic City, N.J., June 8-10, 1951. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., secretary.

Oklahoma conference for veterinarians. June 11-12, 1951, veterinary clinic, Oklahoma A. & M. College, Stillwater, Okla. J. W. Wolfe, Oklahoma A. & M. College, School of Veterinary Medicine, Stillwater, Okla., chairman.

Ohio State University. Annual conference for veterinarians. College of Veterinary Medicine, The Ohio State University, Columbus, June 13-15, 1951. R. E. Rebrassier, chairman.

(*Continued on p. 30*)

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(WATCH YOUR ENGLISH — *continued from p. 26*)

Va.	W. Va.	Wis.
Vt.	Wash.	Wyo.

Alsk. equals Alaska, though seldom so used; T.H. signifies the Territory of Hawaii; P.R. equals Puerto Rico; V.I. is Virgin Islands; and the Philippines are abbreviated P.I.

The provinces of Canada are abbreviated as follows:

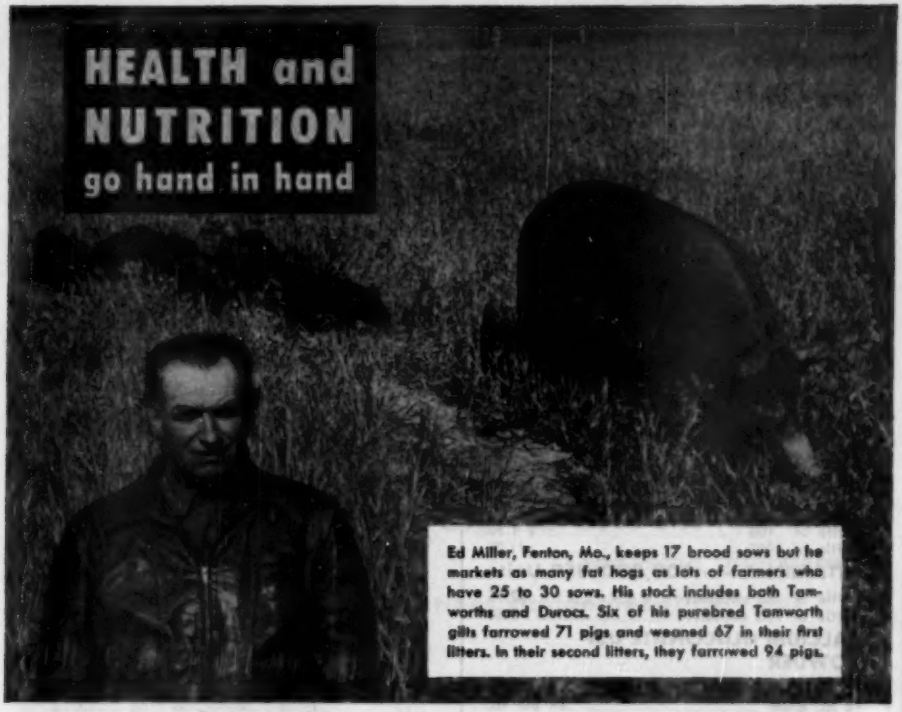
Alta.	Ont.	P. E. I.
B. C.	N. B.	Que.
Man.	N. S.	Sask.

Cape Breton Island—C.B.I.—is a part of Nova Scotia.

It is good usage to omit the abbreviation of the major political division after well-known cities, some of which are:

Baltimore	Cincinnati	Indianapolis
Bombay	Cleveland	Istanbul
Boston	Denver	London
Budapest	Detroit	Madrid
Buenos Aires	Dublin	Manilla
Buffalo	Havana	Miami
Calcutta	Hong Kong	Minneapolis
Chicago	Honolulu	Montreal
Moscow	Pittsburgh	Shanghai
New Orleans	Prague	Stockholm
New York	Rio de Janeiro	St. Louis
Oklahoma City	Rome	The Hague
Omaha	Salt Lake City	Tokyo
Oslo	San Antonio	Vancouver
Paris	San Francisco	Warsaw
Philadelphia	Seattle	Winnipeg

(*To be continued*)



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Of course, part of his success can be traced to the health of his stock and the ration they receive. For like many other good hog growers, Mr. Miller consults his veterinarian on health problems and gets help nutrition-wise from his Purina Dealer.

RALSTON PURINA COMPANY
St. Louis 2, Missouri

WORKING TOGETHER FOR A PROSPEROUS AGRICULTURE

(COMING MEETINGS — *continued from p. 26*)

Georgia Veterinary Medical Association. Annual meeting. Atlanta Biltmore Hotel, Atlanta, Ga., June 16-18, 1951. Chas. C. Rife, 420 Edgewood Ave., N.W., Atlanta, Ga., secretary.

Massachusetts Institute of Technology. Special course in food technology. Massachusetts Institute of Technology, Cambridge 35, Mass., June 25 to July 13, 1951. Professor Walter H. Gale, director of the summer session.

New York State Veterinary Medical Society. Annual meeting. Mark Twain Hotel, Elmira, N.Y., July 11-13, 1951. J. S. Halat, 1231 Gray Ave., Utica, N.Y., executive secretary.

American Veterinary Medical Association. Annual meeting. Milwaukee Auditorium, Milwaukee, Wis., Aug. 20-23, 1951. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Canadian Veterinary Medical Association. Third annual meeting. Banff Springs Hotel, Banff, Alta., Sept. 8-11, 1951. J. G. Anderson, 1016 9th Ave. W., Calgary, Alta., chairman, local committee.

Second International Gerontological Congress. St. Louis, Mo., Sept. 9-14, 1951. E. V. Cowdry, 660 South Kingshighway, St. Louis 10, Mo., president.

Nutritional Conference for Veterinarians. Annual conference. Iowa State College, Ames, Iowa, Sept. 13, 1951. C. D. Lee, Iowa State College of Agriculture, Ames, Iowa, extension veterinarian.

Cornell Nutrition Conference for Feed Manufacturers. Statler Hotel, Buffalo, N.Y., Nov. 1-2, 1951. J. T. Reid, Department of Animal Husbandry, Cornell University, Ithaca, N.Y., chairman.

Regularly Scheduled Meetings

Bay Counties Veterinary Medical Association, the second Tuesday of each month. Russell P. Cope, 1205 San Pablo Ave., Berkeley 6, Calif., secretary.

Cedar Valley Veterinary Association, the second Monday of each month (except July and August) at Black's Tea Room, Waterloo. F. E. Brutsman, Traer, Iowa, secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Thomas Eville, Route 1, Box 136H, Fresno, Calif., secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

(*Continued on p. 32*)

ANTI-CANINE DISTEMPER SERUM

produced from dogs that have also received repeated injections of infectious canine hepatitis virus

Anti-Canine Distemper Serum thus FORTIFIED is your double-edged sword against two diseases of high fatality having almost identical early symptoms. It is your extra precautionary measure *in a single injection.*

Sold only to qualified Graduate Veterinarians

Supplied in 50 CC. and 100 CC. vials

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Grafton, Wisconsin, U.S.A.

distributed by:
WINTHROP-STEARNS, INC.
1450 Broadway, New York 18, New York

(COMING MEETINGS — *continued from p. 30*)

East Bay Veterinary Medical Association, bimonthly, the fourth Wednesday. O. A. Soave, 5666 Telegraph, Oakland, Calif., secretary.

Fayette County Veterinary Association, Iowa, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Greater St. Louis Veterinary Medical Association. Ralston-Purina Research Building, St. Louis, Mo., the first Friday in February, April, June, and November. W. C. Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association, Houston, Texas, the first Thursday of each month. Edward Lepon, Houston, Texas, secretary-treasurer.

Illinois Valley Veterinary Medical Association, the second Wednesday of even-numbered months. R. A. Case, 400 S. Garden St., Peoria, Ill., secretary.

Indiana Tenth District Veterinary Medical Association, third Thursday of each month. L. A. Snider, New Palestine, Ind, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month, in Louisville or within a radius of 50 miles. F. M. Kearns, 3622 Frankfort Ave., Louisville 7, Ky., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at the Hotel Continental. T. M. Eagle, Parkville, Route 2, Mo., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month, in the Hotel Continental, 11th and Baltimore, Kansas City, Mo. K. M. Curts, 70 Central Ave., Kansas City 18, Kan., secretary.

Keystone Veterinary Medical Association, the Penn-Sheraton Hotel, 39th and Chestnut St., Philadelphia, Pa., on the fourth Wednesday of each month. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., corresponding secretary.

Maricopa County Veterinary Association, the second Tuesday of each month. Charles J. Prchal, 1722 East Almeria Road, Phoenix, Ariz., secretary.

Michiana Veterinary Medical Association, the second Thursday of each month. Write R. W. Worley, secretary, 3224 L.W.W., South Bend, Ind., for location.

Michigan, Southeastern Veterinary Medical Society. Herman Kiefer Hospital, Detroit, Mich., the second Wednesday of each month from October through May.

Milwaukee Veterinary Medical Association. Wisconsin Humane Society, 4150 N. Humbolt Ave., Milwaukee, Wis., the third Tuesday of each month. Kenneth G. Nicholson, 2161 N. Farwell Ave., Milwaukee, Wis., secretary.

(*Continued on p. 36*)

There's

LEAN, RED MEAT* in KEN-L-RATION

It Says So On The Label

INGREDIENTS: Water, HORSE MEAT, Ground Horse Bone, Soya Grits, Oatmeal, Wheat Products (Cracked Wheat, Wheat Gray Shorts, Wheat Bran), Cracked Barley, Horse Meat Broth, 3.2%, Salt 0.5%, Primary Dried Yeast 0.18%, Irradiated 7-Dehydrocholesterol 0.0%, Onion and Garlic Powder for flavoring, Sodium Nitrite 0.005%, Carotene 0.003%.

MANUFACTURED BY The Quaker Oats Company CHICAGO, ILL., U.S.A.

Fortified With Vitamins and Minerals, Too!

*When you recommend KEN-L-RATION, you are sure it is a dog food that gives sound nutrition. As it says on the label, every can contains lean, red meat—choice cuts of U. S. Government Inspected horse meat. This famous food also contains all vitamins, minerals and other elements known to be essential for dogs. Extensive kennel tests and the experience of many leading veterinarians prove that dogs of all breeds thrive on KEN-L-RATION. You can recommend it with confidence to dog owners.

KEN-L-RATION

The Quaker Oats Company
Ken-L-Products Division
Chicago, Illinois

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, $2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra. Remittance must accompany order.

Deadline for want ads 8th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 So. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

WANTED—a young graduate veterinarian interested in assisting with journalistic work and general publicity routine with an ethical veterinary supply company. Ability and interest in future technical writing are essential. Write, giving age, qualifications, experience if any, and starting salary expected. Enclose photo. Address "Box E 5," c/o JOURNAL of the AVMA.

Experienced, capable veterinarian wanted to manage small animal hospital. Must have California license. Either salary or commission. Address "Box D 1," c/o JOURNAL of the AVMA.

WANTED—veterinarian to assist in small animal hospital in Chicago. Single. Give full particulars in first letter. Address "Box E 7," c/o JOURNAL of the AVMA.

Veterinarian wanted as assistant in Connecticut small animal practice. State qualifications, age, marital and military status, and salary. Attractive 3-room furnished apartment available. Address "Box E 8," c/o JOURNAL of the AVMA.

WANTED—partner-assistant. Guarantee $5,000 annually. Modern small animal hospital. In the East. State complete qualifications, experience, references, and personal description in first letter. Address "Box E 10," c/o JOURNAL of the AVMA.

WANTED ASSOCIATE VETERINARIAN—small animal hospital in Maryland. Must be gentile, experienced, and from AVMA-approved school. Permanent position, salary open. Send full information first letter. Address "Box E 16," c/o JOURNAL of the AVMA.

Wanted—Positions

WANTED—assistantship in California by recent graduate. Small animal or mixed practice. Willing, able, and of good appearance. Residing in California now and available at once. Address "Box E 1," c/o JOURNAL of the AVMA.

OFFER—to any veterinary surgeon who is interested in obtaining an assistant under the following conditions. I do not demand any wage. For one year of work, the veterinarian is to pay the cost of my crossing from Vienna to the United States and should provide room and board. I was

(*Continued on p. 42*)

(COMING MEETINGS — *continued from p. 32*)

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. C. Edward Taylor, 2146 South Broad St., San Luis Obispo, Calif., secretary.

New York City Veterinary Medical Association. Hotel Statler, New York, N. Y., the first Wednesday of each month. C. R. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month. V. E. Graff, Oakdale, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. James R. Ketchersid, 666 East Highland Avenue, San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, bimonthly, the second Tuesday of each month. J. H. Bower, P. O. Box 355, Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. E. W. Paul, Box 866, Redwood City, Calif., secretary.

Pima County (Arizona) Veterinary Medical Association, the third Wednesday of each month, in Tucson. R. W. Adami, 2103 S. 6th Ave., Tucson, Ariz., resident secretary.

Portland (Oregon) Veterinary Medical Association, the second Tuesday of each month, in the Auditorium of the Upjohn Company. L. G. Nicholson, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. John E. Wion, 3164 Redwood Highway South, Santa Rosa, Calif.

Roanoke-Tar (N. Car.) Veterinary Medical Association, the first Friday of each month, 7:00 p.m., in Rocky Mount. G. L. Gilchrist, Edenton, N. Car., secretary.

Sacramento Valley Veterinary Medical Association, the fourth Friday of each month. R. C. Goulding, 11511 Capitol Avenue, Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. R. J. McFarland, 3621 Jewell St., San Diego 9, Calif., secretary.

Southern California Veterinary Medical Association, the third Wednesday of each month. D. H. McDole, 8674 Melrose Ave., Los Angeles 46, secretary.

South Florida Veterinary Society, the third Tuesday of each month, 8:00 p.m., at the Peckway Skeet Club, Robert P. Knowles, 2936 N.W. 17th Ave., Miami, Fla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month, 8:00 p.m., at the Tulsa Hotel. R. S. Todd, 1222 S. Lewis, Tulsa, Okla., secretary.

(*Continued on p. 38*)

Friskies

Authoritative information on the scientific care and feeding of dogs. Published by Albers Milling Company (a division of Carnation Company) under the supervision of Dr. E. M. Gildow, B.S., M.S., D.V.M., Director of Research.

No. 9

DOG RESEARCH NEWS

Meat in the Diet of Dogs

Raw muscle meat is deficient in many of the nutrient requirements of the dog. A dog needs vitamins A and D. He can't get these from meat alone. Muscle meat is also deficient in minerals.

Suppose you have a ration that contains all the known necessary vitamins and minerals in proper proportion. Then you mix it half and half with meat. By so doing you reduce the vitamin A and D content of the ration one-half, and might not now have enough of these essentials. Thus, by adding meat you risk throwing a complete ration off balance.

When you feed Friskies *alone*, your dogs get every food element known to be needed for complete

Extra meat can destroy the sensitive balance of the essential elements in a scientifically prepared dog food like Friskies.

nourishment. This has been proven in 19 years of study at the Friskies Kennels. By adding meat you may upset Friskies' scientific balance and incur unnecessary expense as well.

Meat and Reproduction

It has been known for many years that certain dietary factors are essential for reproduction that are not necessarily required for general maintenance or even for growth.

Meat and meat by-products have long been used by dog breeders in an effort to improve the reproductivity of the dog. However, the selection of the meat requires good judgment based on a thorough knowledge of the type of meat required. For it has been definitely established that meat varies in its value for this purpose.

Since the selection of the proper type of meat to improve reproductivity requires so much care and skill—and the meat itself is so expensive—the breeder should be interested in results obtained at the Friskies Kennels. Here, on Friskies alone, Friskies kennel men have regularly produced good litters with bitches giving plenty of milk.

We have had over 50 years' experience in animal nutrition. The results of this experience are yours for the asking. Send your questions about dog feeding, breeding or care to Friskies, Dept. Y, Los Angeles 36, California.

(COMING MEETINGS — *continued from p. 36*)

Foreign Meetings

First Pan American Veterinary Conference. Lima, Peru, Oct. 20-26, 1951. José Santivañez, dean, Veterinary College, San Marcos University, Lima, Peru.

Dr. Harris Appointed Medical Advisor

Dr. J. R. Harris has been appointed medical advisor of the veterinary division of the S. E. Massengill Company, Bristol, Tenn. Employed by that firm since Jan. 1, 1949, he was engaged in practice prior to 1949, and was a captain in the Veterinary Corps during World War II. Dr. Harris, in his new position, will handle all correspondence concerning Massengill veterinary products with the veterinary profession.

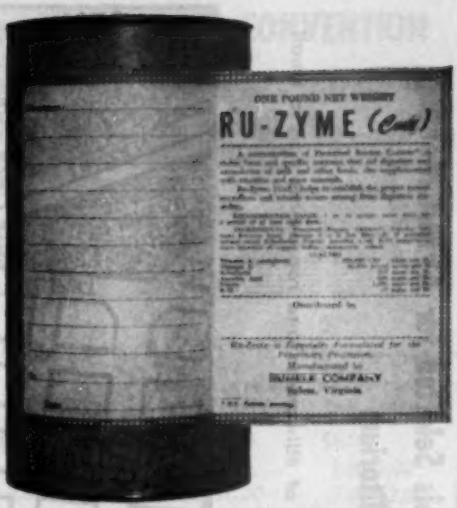
---

*DDT As a Raticide.**—DDT is toxic for rats and mice when sprinkled in powdered form around their shelters, pathways, and holes. A 5 per cent dilution answers the purpose. Cockroaches, lice, fleas, ants, spiders, and other insects also yield to its use in that fashion.

Announcing

RU-ZYME

A NEW, NATURAL AND HIGHLY EFFECTIVE STIMULANT FOR INDUCING PROPER RUMEN FUNCTION IN COWS AND CALVES



ESPECIALLY FORMULATED FOR— SOLD ONLY TO VETERINARIANS

RU-ZYME is a scientifically-blended concentration of *Preserved Rumen Bacteria*, Enzyme Cultures, Vitamins and Trace Minerals.* RU-ZYME is designed for toning the rumen with enzymes and inoculating the rumen with the proper microflora through the presence of *Preserved Rumen Culture.* The enzymes include digestive and stimulating enzymes from selected mold and bacterial cultures. Among the specific enzymes are *Rennet* and *Lactase.* There are also diastatic, proteolytic, and certain fermentation-stimulating enzymes. Other beneficial properties produced are unidentified growth factors and vitamin B complex.

RU-ZYME

PREPARATION FOR COWS

When rumen activity has been reduced or has ceased altogether, RU-ZYME (COW), through its high enzyme activity and vitamins, helps to establish the proper environment of the rumen so that the Preserved Rumen Bacteria present may become implanted and develop and induce proper rumen function.

RU-ZYME

PREPARATION FOR CALVES

This highly concentrated preparation supplies the calf with the necessary rumen bacteria in viable form — essential vitamins and required enzymes for digestion and assimilation of milk as well as other feeds. RU-ZYME (CALF) induces proper function at an earlier age and retards scours arising from digestive disorders.

ONLY RU-ZYME CONTAINS PRESERVED RUMEN CULTURE*

RU-ZYME IS A NATURAL RUMEN STIMULANT—IT CONTAINS ABSOLUTELY NO TOXIC SUBSTANCES

RU-ZYME Preparation for Calves and RU-ZYME Preparation for Cows are both conveniently packed in 1-pound containers.

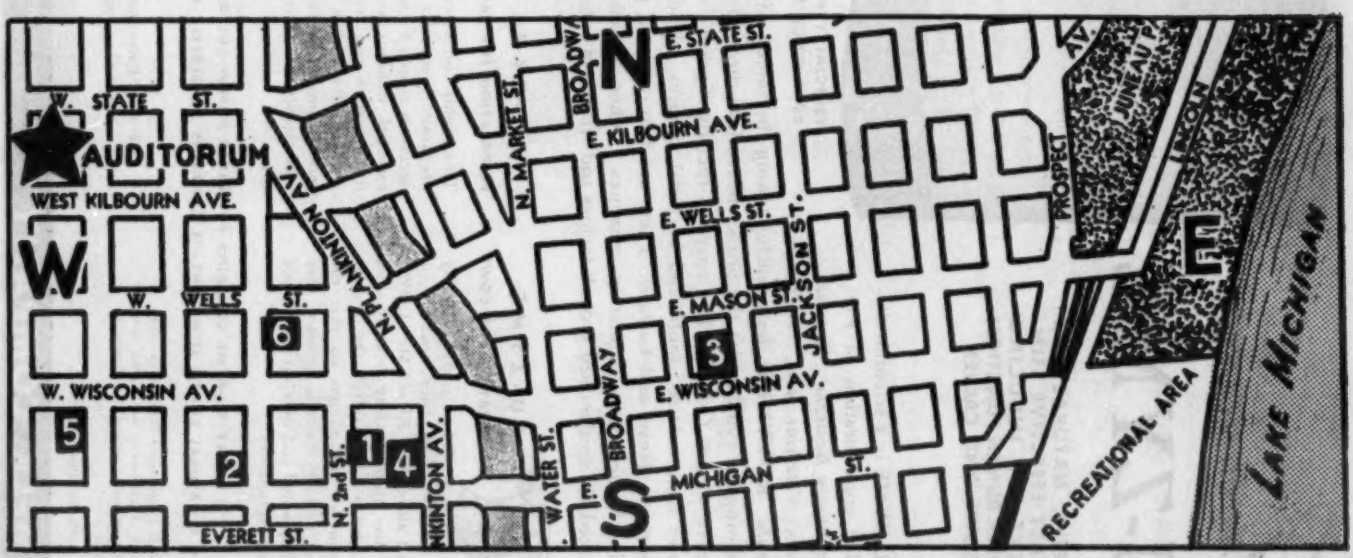
*U. S. Patents Pending

Ask your Veterinary Supply Dealer or Write For Complete Details To

RUMELK COMPANY MANUFACTURERS OF VITAMIN-ENZYME PRODUCTS SALEM VIRGINIA

Street Diagram of Milwaukee, Wisconsin, Showing Hotels Selected for AVMA Meeting and Their Proximity to the Auditorium

Note: *The section shown on this diagram lies in the southeastern part of Milwaukee and represents only a small portion of the city's total area.*



1. Antlers 2. Medford 3. Pfister 4. Plankinton House 5. Schroeder 6. Wisconsin

HOTEL RESERVATIONS — MILWAUKEE CONVENTION

Eighty-Eighth Annual Meeting, AVMA, August 20-23, 1951

Selected hotels listed below are all near the Milwaukee Auditorium, where convention activities will be centered. Fill out reservation form and mail it directly to hotel of your first choice. If that hotel is filled, it will forward your request to another hotel you have named. Confirmation will come from hotel which accepts reservation. Since this is an auditorium convention, there will be no headquarters hotel.

HOTELS AND RATES* — SEE LOCATIONS ON OPPOSITE PAGE

Hotel	Single	Double (with Double Bed)	Double (with Twin Beds)
1. Antlers	$2.25-5.00	$3.50-6.00	$6.00
2. Medford	3.00-4.00	4.25-5.25	6.00-7.00
3. Pfister	3.50-8.00	6.50-10.00	7.00-12.00
4. Plankinton House	3.50-6.00	6.00-8.00	6.50-9.00
5. Schroeder	3.75-10.00	6.50-10.00	8.00-12.00
6. Wisconsin	3.50-7.50	5.50-9.00	7.50-10.00

*Information about availability and rates of suites may be obtained on request to hotels of your choice. See reservation form below.

Cut Off Here

HOTEL RESERVATION FORM — AVMA CONVENTION

To: (Name of Hotel) ..... Date .....

Milwaukee, Wis.

Please make reservations indicated below:

(Three choices MUST be shown.)

First choice hotel .....

Second choice hotel .....

Third choice hotel .....

Accommodations and Rates Desired:

☐ Single room at $..... per day

☐ Double-bed room at $..... per day

☐ Twin-bed room at $..... per day

☐ Send me information about suites

Arriving on (date) ..... at..... a.m. ..... p.m.

Leaving on (date) ..... at..... a.m. ..... p.m.

Room will be occupied by:

Name ..... City and State .....

Name ..... City and State .....

Your Name (print or type) .....

Street Address .....

City ..... Zone ..... State .....

(CLASSIFIED ADS — *continued from p. 34*)

born in 1927, of Austrian parentage, and will finish my studies at the University of Veterinary Science in Vienna in December, 1951. I would like to begin work in the United States in February, 1952. Requests for particular information, certificates, etc., will be given prompt attention. Address Mr. Horst Stadlmaye, Vienna III/40, Rabengasse 6/5F/8, Austria.

Latvian veterinary surgeon, graduate of University of Riga, nineteen years' experience, available as meat inspector or hospital assistant. Single. Speaks and writes English, German, and Russian. Excellent references. Address Dr. E. Kleinbergs, 14 Lincoln Ave., Yeadon, Pa.

Veterinarian with considerable scientific and executive experience desires remunerative position with laboratory or experiment station. Specialty poultry diseases. Thoroughly trained all phases of laboratory work, also practical field man. Widely traveled, trilingual. Address "Box E 18," c/o JOURNAL of the AVMA.

WANTED POSITION—Lithuanian D.P. veterinarian, 31, desires position as assistant. Experience with large and small animals. Graduate, degree in surgery from Munich University. Not fluent English. Address "Box E 17," c/o JOURNAL of the AVMA.

June, 1951 graduate of AVMA-approved school desires position with future in a large animal or mixed practice. Married; 27 years old. Address "Box E 21," c/o JOURNAL of the AVMA.

POSITION WANTED—experienced, draft-exempt Cornell graduate, New York license, desires position in small animal practice leading to purchase or partnership. Also interested in temporary lease or outright purchase of small animal practice. Address "Box E 19," c/o JOURNAL of the AVMA.

Draft-exempt 1951 graduate of Michigan State College desires position as assistant, or to lease a small animal or mixed practice. Married. Some summer experience. Address Mr. Walter S. Tyler, 425 B Hawthorn Lane, East Lansing, Mich.

Student, graduating June, 1951, from AVMA-approved school, age 32, desires veterinary position with experienced practitioner or information leading to a veterinary opportunity. References and photo on request. Address "Box E 20," c/o JOURNAL of the AVMA.

Wanted—Practices

PRACTICE WANTED—small or large animal. Will lease until able to purchase. Will consider partnership or assistantship with option to buy. Experienced, age 33, married, service exempt. Address "Box E 14," c/o JOURNAL of the AVMA.

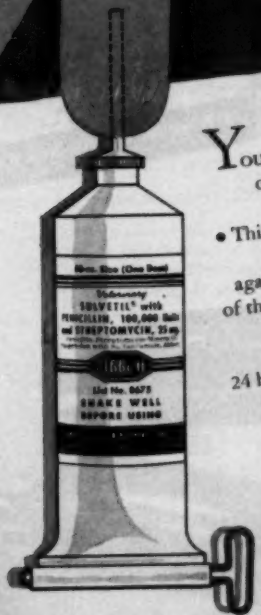
WANTED—by experienced veterinarian, to purchase lucrative small animal hospital and residence. Substantial cash available. Address "Box E 4," c/o JOURNAL of the AVMA.

PRACTICE WANTED—Experienced veterinarian desires to purchase or lease modern small animal hospital, either one- or two-man practice. Califor-

(*Continued on p. 46*)

NOW 3-way Mastitis Therapy

in
single dose
applicator
tubes



You can leave syringes, bottles and vials in the office when you treat mastitis with SULVETIL with PENICILLIN and STREPTOMYCIN.

• This stable, homogenized mineral oil suspension offers an antibacterial combination effective against both gram-positive organisms and those of the coliform group—yet it's easy to administer. Simply insert tube in teat canal, roll it up with key. Four such applications, one every 24 hours, are sufficient in most mastitis infections.

• Why not take advantage of this convenient, comprehensive therapy? SULVETIL with PENICILLIN and STREPTOMYCIN is available in single-dose, 50-cc. tubes, with teat tube applicator, through your usual source of supply.

Abbott

SULVETIL®

with Penicillin, 100,000 units

and Streptomycin, 25 mg.

(Penicillin-Streptomycin Mineral Oil Suspension with Sulfasilamide, ABBOTT)

SQUIBB *introduces*

SQUIBB

NOVOXIL UTERCAPS*

...for the treatment of retained placenta, metritis and pyometra

Description:	An elongated gelatin capsule containing approximately 0.36 grams of active colloidal silver oxide.
Indications:	For the treatment of retained placenta, metritis and pyometra in cows and mares.
Advantages:	Easy to insert. Extremely effective. Economical. Nontoxic. Stable.
Dosage:	*Retained placenta*—Insert one Utercap into each horn of the uterus. If the condition of the uterus prevents insertion into the horns, place two Utercaps into the uterine cavity or deeply into the cervical canal. If infection persists after 7 days, insert an additional Utercap. *Metritis*—Insert two Utercaps into the uterus; one into each horn if possible. If the infection persists after 7-10 days, insert an additional Utercap. *Pyometra*—Insert two Utercaps into the uterus. If the infection persists after 7 days, insert an additional Utercap.
Administration:	By hand or by use of balling gun.
How Supplied:	In boxes of 3 Utercaps that bear tear label and full instructions. Four boxes of 3 in cardboard shipper.
Expiration:	None. Should be kept in cool place, not exceeding 59 degrees F.

For further information, address E. R. Squibb and Sons, Dept. AV-11, Veterinary and Animal Feeding Products Division, 745 Fifth Avenue, New York 22, New York.

* *"Utercap" is a trade-mark of E. R. Squibb & Sons*

-A NAME YOU CAN TRUST

(CLASSIFIED ADS — *continued from p. 42*)

nia or Southwest location preferred. Married, service exempt. Address "Box E 2," c/o JOURNAL of the AVMA.

A graduate of an AVMA-approved school, who has had several years of experience, wishes to buy or lease a large animal or mixed practice located in the Middlewest. Address "Box E 23," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

FOR SALE—small animal hospital or dog kennel in Florida, just outside the city of Orlando. Three-bedroom home, grounds nicely landscaped. $16,700. Address "Box D 2," c/o JOURNAL of the AVMA.

FOR SALE OR LEASE—small animal practice. In West Coast state, town of 8,000. Priced at current value of real estate plus inventory. Hospital and modern home included. 1950 gross approximately $10,000. Address "Box E 3, " c/o JOURNAL of the AVMA.

FOR SALE—established mixed practice, Nashville Cat and Dog Hospital. Tennessee serum distributors. Price $3,000; no real estate. Equipment, biological products, and drugs. Address Dr. E. E. Nisbett, 3023 West End, Nashville, Tenn.

FOR SALE OR LEASE—booming southern California coastal practice, large animals optional. Modern hospital. Address "Box E 6," c/o JOURNAL of the AVMA.

FOR SALE—mixed practice in state of Washington. Approximately 50 per cent small animals. Well-equipped hospital with 35 kennels and room for expansion. Established eight years. Will sell drugs and adjoining 3-bedroom home also. Address "Box E 9," c/o JOURNAL of the AVMA.

FOR SALE—IN NEW H-BOMB AREA—well-established small animal practice, including modern hospital, well-equipped. Grossing over $20,000 and still growing. Opportunity unlimited. Address John B. Murray Co., Realtors, 122 8th St., Augusta, Ga.

FOR SALE—small animal hospital in San Francisco Bay area, established three years, modern equipment, 36 kennels. Address "Box E 11," c/o JOURNAL of the AVMA.

FOR SALE—a real buy. Small animal hospital near Los Angeles. No real estate. Grossed $20,000 last year. Forty animal capacity. Expecting recall to Army. $12,000 cash or $13,500 terms. Address "Box E 12," c/o JOURNAL of the AVMA.

FOR SALE—in Texas, modern hospital with spacious living quarters. 80 per cent small animal, 20 per cent dairy. No small animal competition. Two other sources of income. Annual gross, $24,000. Price $25,000 includes everything. $15,000 cash, balance terms. Address "Box E 13," c/o JOURNAL of the AVMA.

FOR SALE—mixed practice, twenty-five years in Sandusky, Ohio. Two acres, 7-room house, office, laboratory fully equipped, 20 kennels, two stalls,

(*Continued on p. 48*)

5 REASONS WHY MERAMETH®

Sterile Solution

SODIUM SULFAMERAZINE 5% AND SODIUM SULFAMETHAZINE 5%

Promptly combats Pneumonia, Hemorrhagic Septicemia, Foot Rot

1. **Prompt therapeutic blood levels after parenteral administration.**
2. **Effective blood levels for 24 hours after a single intravenous dose.**
3. **Antibacterial action equal to total concentration of both drugs.**
4. **Optimum drug concentration for intravenous administration.**
5. **Marked decrease in acute and chronic toxicity.**

MERAMETH *Sterile Solution* is administered by intravenous or intraperitoneal injection. It may be administered also by intramammary infusion for treatment of mastitis.

Supplied: **No. 2324**—250-cc. and 500-cc. rubber-capped bottles.

Dispensed only by or on the prescription of a veterinarian.

VETERINARY DIVISION SHARP & DOHME PHILADELPHIA 1, PA.

BRANCHES: Atlanta, Baltimore, New York, Denver, Memphis, Los Angeles, Columbus, Boston, Chicago, Portland, San Francisco, Kansas City, Dallas, St. Louis, New Orleans, Minneapolis

Notice to Contributors

Journal of the AVMA

and the

American Journal of Veterinary Research

Exclusive Publication.—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals.

Manuscripts.—Manuscripts must be typewritten, double-spaced, and the original, not the carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise and to the point. Short, simple sentences are clearer and more forceful than long, complex ones. Footnotes and bibliographies **also** should be typed **double space** and should be prepared in the following style: name of author, title of article, name of periodical with volume, month (day of month, if weekly), and year.

Illustrations.—Photographs should be furnished in glossy prints, and of a size that will fit into the Journals with a minimum of reduction. Photomicrographs which cannot be reduced should be marked for cropping to 1-column or 2-column width. Drawings should be made clearly and accurately in India ink on white paper. Figures appearing on graphs or charts should be large enough to allow for reduction necessary for the chart or graph to fit on Journal pages. All illustrations should bear the name of the author on the back.

Tables.—Tables should be simple. Complex tables are not conducive to perusal. It is wiser to summarize complex material rather than to attempt to tabulate it.

News.—Secretaries of associations and readers are requested to send us announcements of meetings and news items.

Anonymous Letters.—Anonymous communications, of whatever nature or purpose, to the JOURNAL or to the Association will not be published or referred for consideration to any Association official or committee.

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(CLASSIFIED ADS — *continued from p. 46*)

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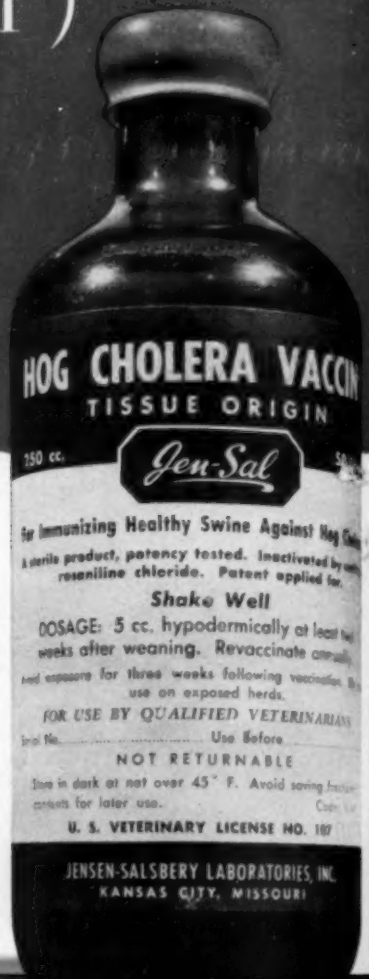

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[1]Cole and Henley: Proc. U. S. Livestock Sanitary Ass'n, 1946.